THE CLINICS
OF
JOHN B. MURPHY, M.D.

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VOLUME V *NUMBER 3*

THE CLINICS

OF

JOHN B. MURPHY, M.D.

AT

MERCY HOSPITAL, CHICAGO

Edited by
P. G. Skillern, Jr., M. D.
of Philadelphia

JUNE, 1916

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TALK BY DR. R. C. COFFEY ON CERTAIN ABDOMINAL OPERATIONS

DR. MURPHY (February 5, 1916): I have the pleasure of presenting to you Dr. R. C. Coffey, of Portland, Oregon, who will address you.

DR. COFFEY: Gentlemen: I was greatly interested in Dr. Murphy's Kraske operation for the removal of the rectum. I asked him the question as to whether he thought he was reducing the mortality as much as half by performing the operation in two stages. He said he thought that he was. The statistics of all surgeons who have tried the two-sitting operation in cancer of the rectum show that the danger is even less than half where the operation is done in two stages. The greatest strides that have been made in gastrointestinal surgery are found in the performance of certain operations in two sittings. During the last two or three years we have been performing stomach resections for pyloric cancer in two sittings and think our mortality has been cut in two in exactly the same way as in resection for rectal cancer. We have performed a number of resections of the stomach for ulcer according to the Rodman technic. Occasionally we perform the von Eiselsberg operation, making a unilateral exclusion. The mortality following these operations is certainly two or three times that of gastroenterostomy alone. During the last two or three years we have performed gastroenterostomy at the first operation, and from two weeks to several months later carried out resection of the pylorus. In this way we have cut the mortality of resection of the stomach down to practically that for gastroenterostomy alone, for we have not had a single death as a result of the second, or removal, operation. The same is true of our cancer work. We now never remove a cancer of the pylorus in less than two sittings. At the first operation gastroenteros-

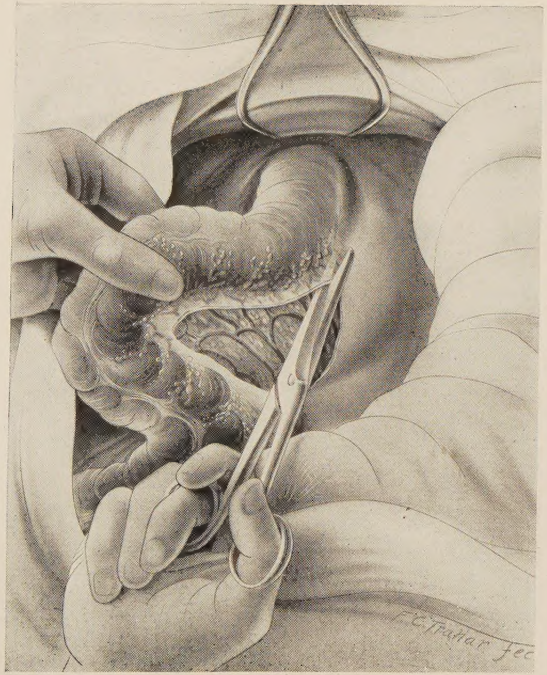

Fig. 67.—The sigmoid is mobilized by cutting the peritoneum on each side of its mesentery (Coffey, in *Annals of Surgery*).

Fig. 68.—The sigmoid is cut between angiotribe forceps with a cautery, and the forceps heated sufficiently to sterilize the ends. Ends are closed and painted with tincture of iodin and mesenteric vessels tied (Coffey, in *Annals of Surgery*).

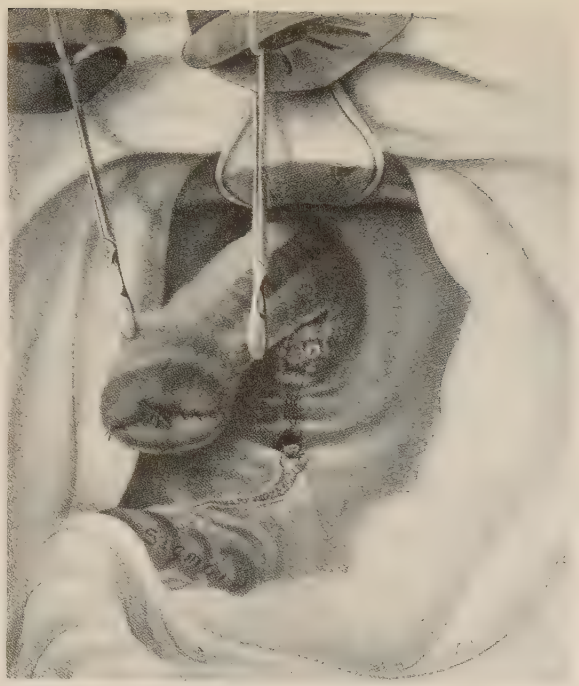

Fig. 69.—Proximal sigmoid wrapped in gauze. Tube is passed up to end of distal sigmoid, where it is fastened by a strong double suture passed through the intestine and eyes of tube and tied. When the intestine is held by two forceps and traction is made on the tube, inversion is produced. Note the ends of the severed superior hemorrhoidal artery (Coffey, in *Annals of Surgery*).

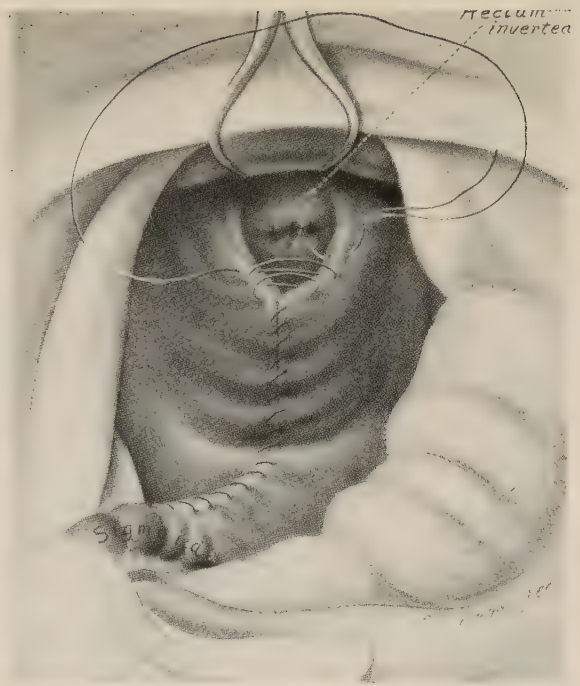

Fig. 70.—After the distal sigmoid has been inverted and drawn out through the anus the inverted end is closed by three or four interrupted catgut sutures, and a continuous catgut suture is run along the mesosigmoid, covering the raw fat edges with peritoneum from the proximal sigmoid to the bottom of the culdesac (Coffey, in *Annals of Surgery*).

tomy—preferably posterior, but sometimes anterior, if more convenient—is performed. The second operation accomplishes the removal of the pylorus with the growth.

We have all noticed cases in which acute abdominal obstruction was due to adhesions. Your patient is vomiting fecal matter and you think that he is in a very bad way. On operating you

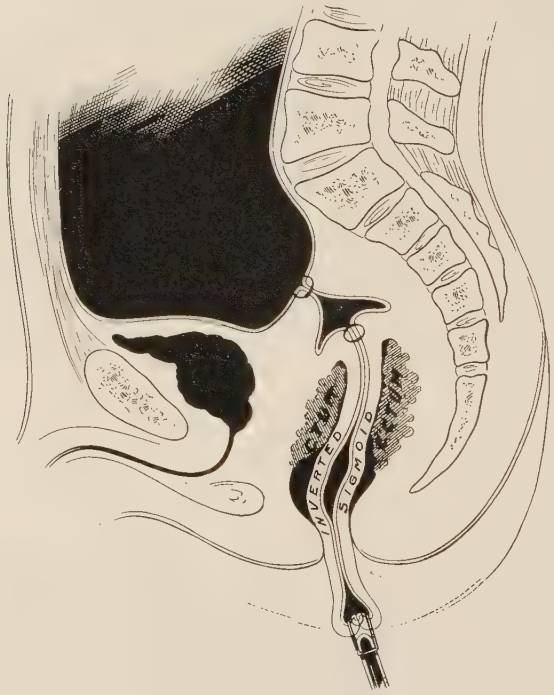

Fig. 71.—Sectional view of sigmoid inverted and drawn out through the anus. Also the peritoneum sutured over end of inverted gut (Coffey, in *Annals of Surgery*).

find an extensive mass of adhesions: if you attempt to break up these adhesions and open up raw spaces, taking a great deal of time, and possibly stripping off the peritoneum with the outer coats of the intestine, you are exposing your patient to great danger. Now if you see the intestine distended above the mass of adhesions and collapsed below, all that is needed is conservative surgery. Simply make a rapid anastomosis between the

distended and collapsed loops, with either the Murphy button or a suture: this can easily be extended in fifteen minutes, and in at least nine cases out of ten the final results will be just as good as though the adhesions had been separated, and the mortality will be less than half.

In cancer of the rectum—cases of which Dr. Murphy has shown here today—we now always operate in two sittings by a method we described in the *Annals of Surgery* for April, 1915 (see Figs. 67–71). We have met with more success by this technic than by any other. In my opinion the popularizing of the two-stage gastrointestinal operation is the greatest advance that has been made of late in abdominal surgery.

Dr. Murphy: I am happy to hear Dr. Coffey talk on these subjects, for he has done so much work in the abdomen that we are very much interested in his opinion.

(See article by Lilienthal: "The Two-Stage Principle in Operative Surgery," in *Annals of Surgery*, 1910, li, 30–39.)

MULTIPLE SARCOMATA OF SKIN

Summary: Clinical history of patient; comments—differential diagnosis from von Recklinghausen's disease; operation—ablation of a tumor for microscopic examination; postoperative comments—arsenic therapeusis; spontaneous disappearance; spontaneous disappearance from intercurrent exanthemata; Kaposi's disease; carcinomatosis cutis; differential diagnosis from mycosis fungoides; metastatic cutaneous sarcomatous growths—their importance in the diagnosis of deep-seated primary sarcomata.

CLINICAL HISTORY OF PATIENT

A MALE, twenty-seven years of age, was admitted to Mercy Hospital September 15, 1915. The family and the personal histories are negative.

Nine years previously, in 1906, a few papules appeared on the patient's forehead and chest, increased in number, and spread until at present almost the entire body is covered by them: they are most abundant on the torso (Figs. 72, 73, 74). The papules vary in size from the head of a pin to a hazelnut; are elevated, pink, and contain a clear, watery fluid; are hard to the feel, and do not disappear or alter their shape or size; their edges are sharply defined; they give rise to itching when the patient sweats.

Microscopic examination of one of the excised tumors at the office revealed sarcoma.

COMMENTS

DR. MURPHY (September 18, 1915): At first glance these cutaneous tumors suggest multiple fibroma molluscum (*von Recklinghausen's disease*), which consists of multiple neuromata associated with cutaneous fibromata: these are nerve-sheath tumors, are small, rarely painful, seldom tender, and as a rule remain benign; nerve-elements are seen microscopically with the aid of special silver stains. There is a malady termed *fibroma molluscum gravidarum* which develops during the latter half of

pregnancy, and is characterized by multiple fibromyxomatous cutaneous tumors of the cervical and pectoral regions: these tumors disappear spontaneously within six months after parturition: they do not contain nerve-fibers, but are edematous fibroids,

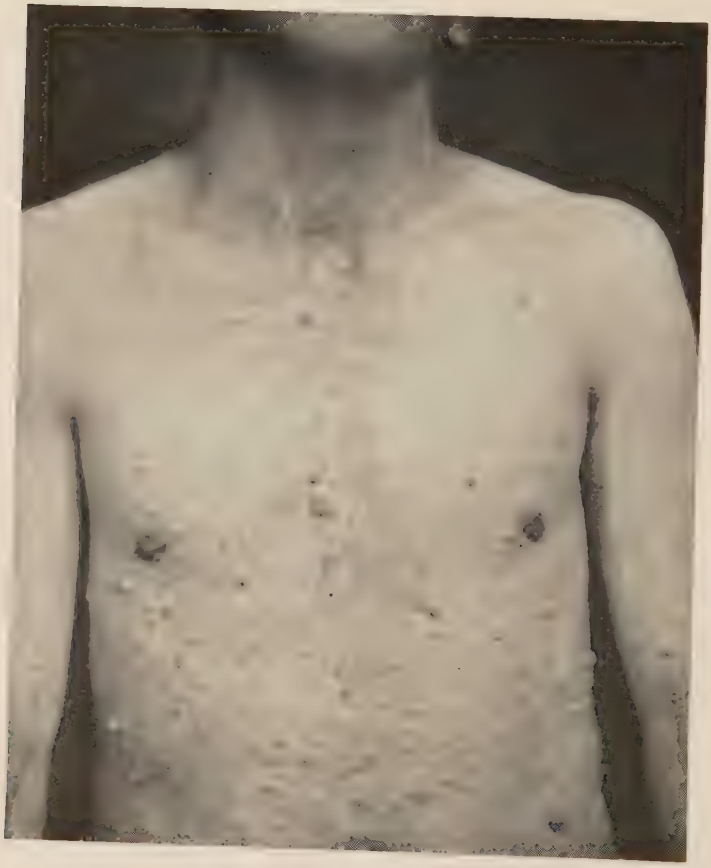

Fig. 72.—Multiple sarcomata of skin.

and resemble molluscum contagiosa more than von Recklinghausen's disease.

The pathologist diagnosed spindle-cell sarcoma from a microscopic specimen: this type signifies a mesoblastic tumor whose cells are atypical and one which should terminate fatally. This

diagnosis ran counter to ours of fibroma molluscum, and I have grave fears that the pathologist's opinion is correct, for sarcoma bodes ill for the patient. The tumors of fibroma molluscum, however, may remain innocent indefinitely unless from trauma one of them should become viciously malignant. We shall remove

Fig. 73.—Multiple sarcomata of skin.

one of the tumors from another position to see if, upon microscopic examination, it should prove, after all, to be a fibroma molluscum.

OPERATION

[Exposes one of the growths through an incision.] . . . Note how cleancut and encapsulated the tumor is. [Ablates

tumor.] . . . See how nicely it shells out—quite independently of the neighboring tissues except the vessels. [Closes wound with a stitch.]

Fig. 74.—Multiple sarcomata of skin.

POSTOPERATIVE COMMENTS

If the pathologist's diagnosis of spindle-cell sarcoma is correct, we have little if any hope for our patient, unless cure should be

effected, as sometimes happens, through colossal doses of arsenic, administered both subcutaneously and by injections directly into each tumor. Much more could be expected of arsenic, however, in the cure of sarcomata of the lymphoid type. In giving arsenic in such colossal doses one must beware of hemorrhagic nephritis. In rare instances the tumors of cutaneous sarcoma disappear spontaneously, but one has no means whatever of anticipating such a desirable result. The spontaneous disappearance of certain tumors from intercurrent exanthemata, too, must not be overlooked: thus, Fischer (*Deutsche Ztschr. f. Chir.*, xii, 60) noticed the disappearance or minifying of *sarcoma*, adenoma, and lymph-node tumors from the intercurrence of scarlatina and typhoid fever, while fibroma, lipoma, chondroma, osteoma, and carcinoma remained unaltered; he also saw struma disappear especially rapidly in cholera. The *modus operandi* of Coley's fluid must rest upon similar biologic grounds.

In his original paper, entitled "Ueber einen Fall von sogennanter Sarcomatosis cutis," Kaposi (Bruns, *Beiträge zur klin. Chirurg.*, 1899, xxiv, 526–534) defines the disease which bears his name as follows: "Beginning in the subcutis (as the histologic picture showed, and as we could recognize in the nodules arising *de novo* under our eyes) were painless, brownish-red tumors at first the size of a pea, then growing to the size of a nut, even forming elevated, hemispheric plaques the size of the palm of the hand, and shaped like a flat cake. The disease runs a chronic course, and the internal organs are almost always free."

One cannot help being reminded of the benignity of the carcinomatosis cutis of industrial workers—notably the cutaneous cancer of paraffin workers.

Melanotic sarcomata of the skin at times occur and form virulent metastases throughout the body, especially after trauma, accidental or operative.

The tumors of mycosis fungoides are liable to be mistaken for sarcoma, as they also develop from red, uneven spots, and form granulation-tumors of a brownish-red color which, in the later stages, tend to ulceration and cachexia; but mycosis fungoides is of much slower growth than sarcoma. Syphilitic and

tuberculous granulomata can hardly be confounded with sarcoma on careful examination.

Primary multiple sarcomata must not be confounded with secondary sarcomatous growths in connection with a primary cutaneous sarcoma, or a sarcoma of the internal organs. Thus I removed a wen-like mass from a patient's scalp which, upon examination, proved to be a small, round-cell sarcoma, and which was metastatic to the primary sarcoma in the left fibula. (See *The Medical Clinics of Chicago*, March, 1916, 1039–1049.) The importance of searching for and examining such superficial metastatic growths in the diagnosis of deep-seated malignant tumors has been emphasized by Babcock (*New York Medical Journal*, January 18, 1913), who concludes: "Superficial metastases are often absent, but when they are present, it seems to me a waste of scientific energy for those who do not need the experience or mental exercise to spend days and weeks in metabolic tests, repeated physical examinations, and much deductive reasoning, when, almost by a snip of the scissors, a bit of tissue may be secured that may give absolute evidence as to the character of the disease."

Postscript (February 25, 1916).—The patient reported today for examination. The tumors are becoming softer, and many are showing the appearance of congenital papillomata: their malignant characteristics are rapidly disappearing. He is to continue the use of sodium cacodylate.

INFECTIVE COSTAL PERICHONDRITIS—RESECTION OF COSTAL CARTILAGES

Summary: Clinical history of patient; comments—types of infection; pathogenesis; operation; postoperative comments—infections due to flora of mouth; cutaneous diphtheria; hyphomycetic infections; sporotrichosis; actinomycosis; blastomycosis.

CLINICAL HISTORY OF PATIENT

A MALE, thirty-three years of age, was admitted to Mercy Hospital February 15, 1916. The family and the past histories are negative. There was no history of typhoid fever.

Nearly two years previously, on April 1, 1914, while in the dental chair, the drill fell out of the operator's hand and wounded the patient over the left fifth rib, three inches from the sternum: the drill was immediately removed.

Three days later the wound swelled and became painful and the patient developed fever.

Five days later (eighth day after injury) the abscess was opened and much pus evacuated: a small rubber drain was inserted. The patient remained in bed for about two weeks, and when he got up and about there was no fever, nor were there any chills.

Three months after the injury, in July, 1914, owing to continuance of the discharge, the left seventh rib was curetted at the costochondral junction: the patient was laid up for one week; there was no fever, nor were there any chills. The operation did not result in checking the discharge.

Eight months after the injury, on December 8, 1914, owing to swelling of the wound and pain in it, as well as the very profuse discharge, the patient went to a hospital and was operated upon on December 18, 1914.

Seven months afte· the operation, in July, 1915, a tumor about the size of a hen's egg appeared above the ensiform process, and ½ inch to the left: this tumor was incised.

Eleven months after the last operation, in November, 1915, owing to continuance of the discharge, the ensiform process was again curetted: this time the patient was laid up for three weeks, again without fever or chills. The discharge still remained, however. There is marked pain along the left eighth rib for a distance of five inches.

Examination by Dr. Murphy (February 8, 1916).—There is much tenderness over the left fifth rib and its cartilage. While the nature of the tissue-disintegration suggests costal tuberculosis (see vol. iv, August, 1915, 697–698), yet the tuberculin test was negative, and bacteriologic examination of the discharge from the sinus revealed no tubercle bacilli.

COMMENTS

Dr. Murphy (February 17, 1916): This type of infection is usually hematogenous—tuberculous or typhoid. In both instances the infection exhibits a predilection for the perichondrium, and both are obstinate to treatment, particularly the typhoid infection, in which curettage is frequently repeated 8, 10, 12, and even 20 times (see vol. iv, August, 1915, 698). To be effective, operation must be thorough: all involved areas of the cartilage or rib must be exposed, the rib or cartilage resected, and the wound curetted until all the granulation-tissue is removed, and then drained.

The infection in this patient is probably mycelial or bacterial (B. coli) from the mouth: it is a type which we have never seen before. While the cartilage itself resists infection, yet the power of resistance of the perichondrium is but feeble. The infection travels around the cartilage, beneath the perichondrium, elevates the latter, and by thus interfering with the nutrition of the cartilage, causes erosion and even necrosis and sequestrum-formation: the sternum or ribs may also be involved by continuity.

OPERATION

[Through an extensive vest-flap incision the diseased area was exposed and was found to comprise the left seventh and eighth costal cartilages throughout their length: both cartilages were

removed *in toto*, exposing the underlying parietal pleura; the sinuses were laid open throughout their length and curetted, and all visible granulation-tissue was removed, even from beneath the ensiform cartilage, although the sterum itself was not involved. The wound was left open and loosely filled with gauze.]

POSTOPERATIVE COMMENTS

In order to accelerate healing we shall order *x*-rays in therapeutic doses.

It will be noted that these cartilages, while eroded and cloudy in their appearance, did not show the collar-button excavations so commonly associated with typhoid infections of the perichondrium.

In this whole class of cases, a most extensive dissection must be performed, and the cartilage should be removed from its attachment to the sternum, to and including the line of demarcation between the rib and the cartilage, as this is the only hope of preventing recurrence of the infection. This has been accentuated in my recent article, "Bone and Joint Diseases in Relation to Typhoid Fever" (*Trans. Amer. Surg. Assoc.*, 1915, and to appear in *Surg., Gynec. and Obstet.*).

Infections of the soft tissues of the body with the flora of the mouth are characterized by their foulness and often by their virulence. These flora are legion, comprising many varieties of bacteria (Leptothrix buccalis of Robin; fusiform bacillus of Vincent), parasites (spirilla of Vincent; Spirocheta pallida; amebæ), and fungi (molds). Stinking infections of the hand arising from fist-blows upon the teeth—questionably diphtheroid infections—rapidly succumb to the alkalinity which is supplied by sodium bicarbonate dressings. True diphtheria infections of the skin, secondary to faucial, nasal, conjunctival, or vaginal diphtheria, are not common, as shown by the statistics compiled by Filatow from St. Anne's Hospital, Vienna, from 1894 to 1902, where only 23 cases were seen among 2217 diphtheria patients treated. Primary cutaneous diphtheria is still rarer, Billings (*Annals of Surgery*, September, 1915, 343–347) having found but 25 cases in the literature, which, together with his own two cases, total 27.

"Primary cutaneous diphtheria . . . may manifest itself in a single lesion, or in multiple concomitant lesions distributed over a wide area, or in the form of cutaneous and subcutaneous phlegmon, with considerable induration without marked pain, and without fluctuation or suppuration, if not complicated with pyogenic bacteria; and, finally, it may appear in the form of cellulitis with vesiculation resembling erysipelas."

Were our patient suffering from a diphtheria infection we would have applied diphtheria antitoxin directly to the wound, in addition to the usual subcutaneous and intravenous systemic injections.

Of the cutaneous infections due to *hyphomycetes* or molds, those of favus, ringworm, thrush, and tinea versicolor aré well known. There are other forms of hyphomycetes which likewise produce chronic superficial cutaneous lesions (kerion), but about which little is known.

Sporotrichosis is another chronic indolent process following upon trauma, which presents some of the characteristics of tuberculosis and of syphilis, but which does not exactly fit into the picture of either. Sporothrix infections were first described by Schenck in 1898 (*Bull. Johns Hopkins Hosp.*, 1898, ix, pp. 286–290), so that recognition of the disease is comparatively recent, and of late case-reports have been rapidly accumulating in the literature. The organism resembles a bush (mycelium) with its leaves (spores). To the branches of the mycelium the pear-shaped spores are attached by very fine pedicles. The spores become readily detached, and are more apt to be found than the mycelia. The organism grows on ordinary media,—especially the sugars,—and stains readily with basic dyes and is Gram-negative: its invasion may be detected by serodiagnosis and by complement-fixation, using the spore-suspension as antigen.

The period of incubation in man averages one week. Suspicion of the disease, aroused by an infection of unusual nature and protracted course, should lead to its detection by laboratory methods. Iodid of sodium is a specific cure for sporotrichosis, and with large doses healing may be complete within a month.

Actinomycosis is another granulomatous-suppurative process

of this type, although primary actinomycosis of the outer skin, exclusive of the skin of the face and neck, is not frequently encountered, but when present may, according to Leser (*Archiv. f. klin. Chir.*, 1899, xxxix), appear as a circumscribed ulcerated lesion, or as a nodular formation with central cicatrizations. The subcutaneous tissue may also be affected, and a chronic phlegmonous condition may be produced. The diagnosis is made by examining the characteristic yellow granules from the discharge of the ray fungus, which was first described by Bollinger in June, 1877, as occurring in tumors in animals. In April, 1879, Ponfick recognized the first case in man in the Pathologic Institute at Breslau, and proved beyond question that it was identical with Bollinger's case and also proved that a case observed by James Israel, in 1877, was one of actinomycosis, although not so recognized or classified by Israel. Langenbeck, in 1845, described a similar case, but did not know where to place the disease, and did not show its connection with the lesion in animals. The priority of discovery in animals belongs unquestionably to Bollinger, and its recognition in man to Ponfick in 1879. The first case in the human in America was recognized by John B. Murphy, of Chicago, on June 28, 1884. His article on this subject reporting five cases was published in the *North American Practitioner* in 1891. His original case was demonstrated to the Chicago Medical Society at the time of its recognition.

Blastomycosis is characterized by the formation of multiple minute abscesses in the superficial layers of the skin, and is diagnosed by treating a smear of pus from one of the abscesses with a few drops of a 33 per cent. solution of caustic potash, and examining for the characteristic budding saccharomyces, which were first described by Gilchrist in 1894, and the recognition of which was forced on the profession later by Hyde and Ormsby, of Chicago. Iodid of sodium, together with *x*-rays and local measures, is effective in curing this disease as well as actinomycosis.

Postscript.—The case progressed favorably.

DIVERTICULUM OF ESOPHAGUS—CONSERVATIVE TREATMENT

Summary: Clinical history of patient; comments—the diagnosis, pathology, and treatment of esophageal diverticulum.

CLINICAL HISTORY OF PATIENT

A FEMALE, twenty-eight years of age, was admitted to Mercy Hospital January 28, 1916.

Five weeks previously, on December 25, 1915, the patient noticed difficulty in swallowing solid foods and a gurgling sensation in the throat while eating: she chokes very easily. After having ingested certain fruits—such as apples—at night before retiring, the next morning, after a coughing fit, the fruit was regurgitated unaltered by digestion.

Examination by Dr. Murphy (January 28, 1916).—The passage of esophageal bougies suggests esophageal spasm. A skiagram, taken after an opaque meal, reveals a diverticulum of the esophagus at the level of the seventh cervical vertebra: there is no dilated pocket below (Fig. 75).

COMMENTS

DR. MURPHY (January 29, 1916): This is an interesting case. The patient found it increasingly difficult to swallow. I was unable to pass a fairly large esophageal bougie, nor could the next size be passed down until I changed sides and moved it.

These diverticula are very annoying,—especially when in the thoracic portion of the esophagus (Fig. 76),—though easily handled when accessible. The older operation of ablating the sac and suturing the esophagus with a view to obtaining primary union was fraught with much danger from infection of freshly opened tissues. We have shown in a previous article that it is better, after operative exposure of the diverticulum, not to ablate

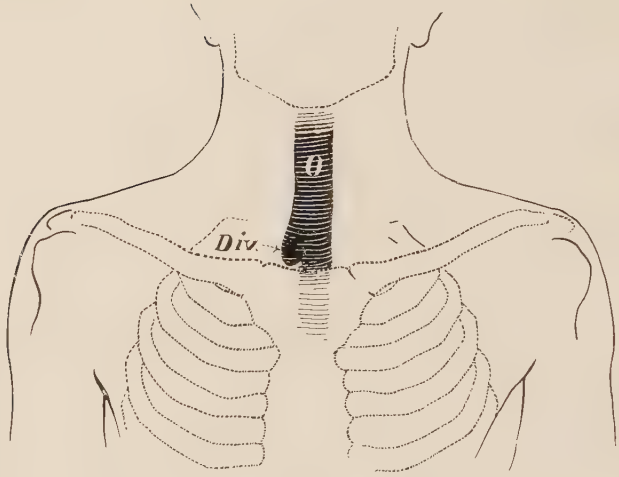

Fig. 75

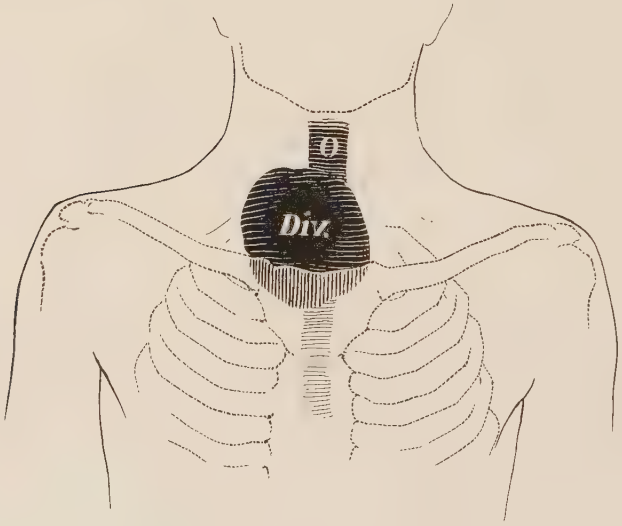

Fig. 76

Figs. 75 and 76.—Sketches of esophageal diverticula interpreted from opaque-meal skiagrams: Fig. 75, Early stage (see text); Fig. 76, moderately large, partly thoracic, but mostly cervical (from another patient).

it immediately, but merely to twist it upon itself and bring it up into the field unopened. After the lapse of sufficient time—twelve to twenty days—to permit of granulation of the operative field and contraction into a firm, cicatricial mass, then, at a second operation, the diverticulum may be safely ablated and the hole in the esophagus closed by suture without the danger of a possibly fatal infective cellulitis ensuing. This is the same principle of coffer-damming which we have applied in the treatment of freshly injured joints; and for the same reason the opening of a colostomy-loop is advantageously postponed for from twenty-four to forty-eight hours.

At present the diverticulum is not serious enough to demand operation, and by having the patient take her nourishment in liquid form, and by cautious dilatation of the esophagus with bougies, the diverticulum will probably contract.

* *

The diagnosis of esophageal diverticulum is established by physical examination if one side of the neck fills up somewhat during swallowing; if a bougie is at one time arrested at a short distance, whereas at another time it passes easily; and if the neck becomes inflated on swallowing, and this swollen portion can be emptied on pressure. Brewer ("Text-Book of Surgery," 1915, 445) considers as a characteristic sign the hourly or half-hourly regurgitation of thick, tenacious mucus. With these signs present an opaque meal is not necessary, but is of confirmatory value.

According to Treves, hernial diverticula of the mucous membrane occasionally occur at the junction of the esophagus and pharynx. They are usually named *pharyngeal pouches*, and protrude between the lower border of the inferior constrictor and commencement of the esophageal musculature, opposite the cricoid cartilage. Since the pouch lies against the spine, it necessarily compresses the commencement of the esophagus when it becomes filled with food (Fig. 77, *Ann. Surg.*, 1910, li, 305). Hertz (*Brit. Med. Jour.*, 1908, i, 132) states that a pouch in this situation may sometimes be identified by *x*-ray examination. Butlin (*Brit. Med. Jour.*, 1898, i, 3) believes that this condition

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is more frequent than has been supposed, and becomes clinically important, as a rule, in men beyond the age of forty. According to Killian (cited by Jonnesco, in Poirier et Charpy's *Traité d'anatomie humaine,* Paris, 3me éd., 1912, T. 4, f. 1, 200), *globus hystericus* is caused by the spasmodic contraction of the circular fibers at the upper orifice of the esophagus, and is the chief cause of the diverticulum just mentioned. A diverticulum is occasion-

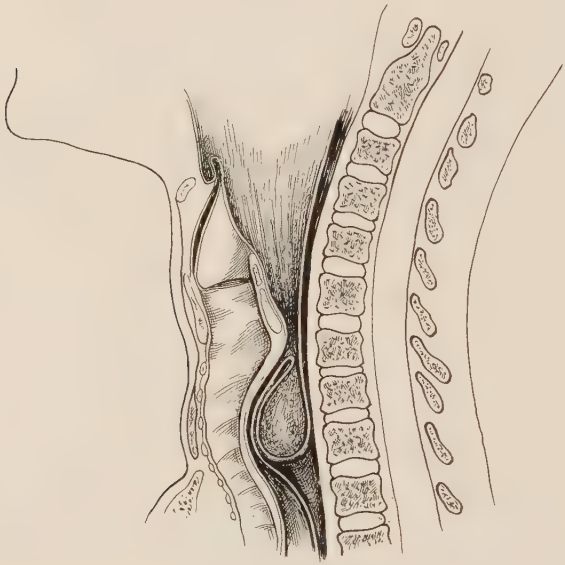

Fig. 77.—Diagram of sagittal section of neck, showing relations of sac to larynx, hypopharynx, esophagus, vertebral column, and sternum, as anticipated from radiographs and found at operation. Note deviation and compression-stricture of esophagus (Stetten, in *Annals of Surgery*).

ally found on the ventral wall near the bifurcation of the trachea, and is stated to be due to traction on the gullet consequent upon cicatrization of adhesions to intertracheobronchial lymph-nodes (Todd, "Clinical Anatomy of the Gastro-intestinal Tract," 1915, 51). This *traction-sac* variety of diverticulum forms one of the two classifications described by Rokitansky in 1840: it rarely produces symptoms, however, and is found at necropsy alone. The

pressure-sac variety is the common diverticulum, and usually involves the junction of the pharynx with the esophagus—the Lannier-Hackermann area.

The accompanying illustrations (Figs. 78 and 79) show a practical method of physical diagnosis used by H. S. Plummer, and reported in *Annals of Surgery*, 1910, li, 812–817.

Fig. 78.—Sound pocketed in a diverticulum. Esophageal probe bulb threaded on a swallowed thread passed into the diverticulum (Mayo, "Collected Papers").

Fig. 79.—Traction on the thread lifting the sound out of the diverticulum. Probe bulb elevated by tightening the thread, showing depth of sac (Mayo, "Collected Papers").

Stetten reviewed the subject of esophageal diverticulum, and gathered a number of operative cases from the literature (*Ann. Surg.*, 1910, li, 300–319): of the total of 60 cases which had been operated upon by various radical methods, 50 were cured and 10 died—a mortality of 16.6 per cent. Primary union of the esophageal wound was obtained in 21 of the 50 cases.

ACUTE CALCULOUS CHOLECYSTITIS—ACUTE PANCREATITIS—CHOLECYSTOSTOMY

Summary: Clinical history of patient; comments—discussion of differential diagnosis; operation—fat-necrosis, induration of pancreas, stone impacted in cystic duct; cholecystostomy; the intense pain of acute pancreatitis; value of gall-bladder in draining pancreas and liver; postoperative comments—review of certain features of case.

CLINICAL HISTORY OF PATIENT

A FEMALE, forty years of age, was admitted to Mercy Hospital December 9, 1915. The family and past histories are negative.

The history of the present illness covers a period of five and one-half years. The first attack was in June, 1910, when the patient suffered from a sharp pain in the upper abdomen, on the right side, just beneath the ribs: there were no chills, nor was there fever, nausea, vomiting, or jaundice; the duration of the attack was ten minutes. These attacks recurred at intervals of three or four months for the next two or three years.

The pain has gradually increased in severity, and during the past year the patient has been doubled up from the pain. It has always been sharp and shooting—never cramp-like; it radiates around to the back and right side. During two attacks the patient vomited bile with relief: she has never vomited blood, nor passed blood in the stool.

Three weeks previous to admission the patient had an attack of pain in the right side, which was so severe as to double her up, but she was not given a hypodermic for the pain. There were no chills, nor was there nausea, vomiting, or jaundice, but the patient states that she felt very hot throughout her body.

Three days before admission the pain recurred, and again the day before admission. At present the patient is very tender throughout the right hypochondrium, and especially sensitive to perpendicular finger-percussion over the gall-bladder.

COMMENTS

Dr. Murphy (December 16, 1915): The patient's leukocyte count one week ago, at the time of admission to hospital, was 18,600. This leukocytosis showed the presence of infection. Arranged in their order of frequency, the upper abdominal lesions which give a similar train of symptoms are, first, gastric ulcer; secondly, duodenal ulcer; thirdly, pancreatic disease; fourthly, gall-bladder disease. [Refers to the cases of cholecystitis associated with pancreatitis which are described below, pp. 401 and 413.] This patient before us is not jaundiced. She is sensitive in the upper abdomen and very fat, so that we are unable to outline the pancreas, although in both the other cases we could clearly outline the organ. This patient's history does not reveal the characteristic story of a gall-stone moving in a duct and giving rise to colic and jaundice, but of an infection of the gall-bladder. In 98 per cent. of the diagnosed infections in the gall-bladder stones are present, according to our statistics up to the present time, but our statistics are going to be rapidly at fault, because we have only been including the cases of acute and chronic calculous cholecystitis which are associated with colic, while we should include that vastly greater number of cases of infections of the gall-bladder associated with great sensitiveness to perpendicular percussion, sensitiveness to hooked finger palpation, with fever and leukocytosis, which heretofore have not been diagnosed as cholecystic infections, but as biliousness, gastritis, etc. The time when the diagnosis of cholelithiasis should be confined to cases with colic and jaundice alone is fortunately now past.

Thus, a patient with a gall-baldder "soreness" and pain of twenty-three years' duration never had colic or jaundice, but at operation her gall-baldder was found filled with stones, some of which were impacted in the mucosa, requiring cholecystectomy in order to remove them. The gall-bladder was a white, cicatricial mass and contained pus as well. There was typical metastatic arthritis from the infection of the gall-bladder, this case being a good example of joint-infection secondary to cholecystitis as a primary source.

OPERATION

This patient is a very large woman, and therefore not a very good operative risk: note how close the costal margin is to the navel! [Vertical incision made through outer portion of right rectus muscle, between ensiform and navel.] . . . As I retract the edges of the wound the first things I see are small plaques of fat-necrosis due to enzymes released from involvement of the pancreas. The gall-bladder is white and filled with stones. [Walls off operative field with gauze pads.] . . . Now I have this field coffer-dammed and am ready to aspirate the gall-bladder. . . . The bile is glycerin-like and inspissated. I can feel a large stone occluding the neck of the gall-bladder and maintaining the hydrops. [Applies purse-string sutures, incises fundus, removes one large calculus and a number of smaller cholesterin calculi, and performs cholecystostomy as described below (p. 405), inserting a hemostatic stitch, maintaining the entropion, and making the gall-bladder mechanically a part of the tube which drains it.] . . .

The entire pancreas is swollen and indurated. The pancreatic enzymes have escaped through the capsule into the peritoneal cavity, producing fat-necrosis, which resembles miliary tuberculosis at first glance. The fat-necrosis accounts for the intense pain the patient had clear across the abdomen. In contrast to colic, intense pain is characteristic of acute pancreatic lesions: no upper abdominal lesion gives rise to such severe pain as fat-necrosis of the pancreas. In the presence of acute pancreatitis the gall-bladder is never removed, because of its value as a means by which to drain not only the pancreas, but also the liver. The omentum, the mesocolon, and the retroperitoneal sac all show pronounced fatty necrosis. [Removes and accounts for gauze sponges and instruments and closes abdominal incision with usual figure-of-8 sutures of silkworm-gut and horsehair, allowing room for exit of rubber tube.]

POSTOPERATIVE COMMENTS

This case was an easy one to handle, for we exposed the cystic and common ducts without encountering a single adhesion. Owing to the tension of the distended gall-bladder, we were

unable to feel the large calculus until after we had emptied the organ of the viscid, syrupy bile, which was too thick to pass through the aspirating-needle. Before closing the abdomen we made sure that bile was flowing through the drainage-tube.

It is our interpretation that these pancreatic lesions—like gastric and duodenal ulcers—come on from practically the same type of infection and at the same season of the year.

The really valuable feature about this case is that the pathologic findings were in complete accord with the clinical history:

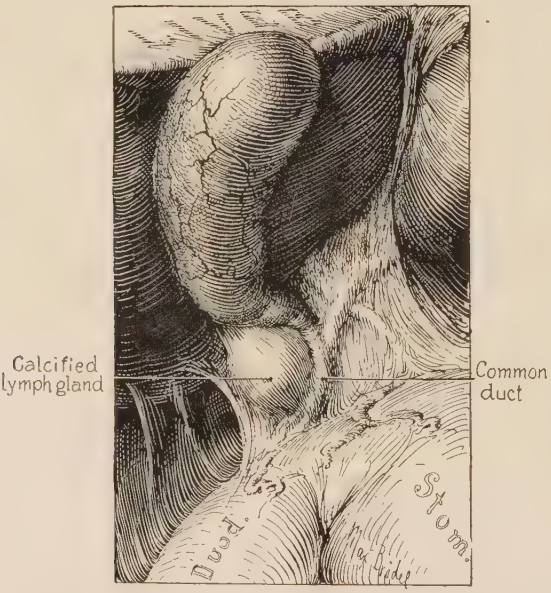

Fig. 80.—A calcified lymph-node embedded in adhesions and lying against the cystic and common bile-ducts (Cullen).

the interpretation of the clinical history and physical signs into pathologic entities is the highest attainment in medicine, and the one for which we are constantly striving.

The accompanying picture of a calcified lymph-node (Fig. 80) is instructive, as it shows how such might be mistaken for a calculus of the common duct.

Postscript (March 2, 1916).—The drainage-tube was removed February 25th,—ten weeks after operation,—and the wound was permitted to close. The patient made an uneventful recovery.

ACUTE CHOLECYSTITIS WITH DIFFUSE PANCREATITIS—CHOLECYSTOSTOMY

Summary: Clinical history of patient; comments—significance of jaundice when preceded by colic and when not preceded by colic; operation—gall-bladder distended, inflamed, adherent; pancreas enlarged and thickened—pancreatic lymphangitis; no calculi in biliary tract; cholecystostomy performed; post-operative comments—when to remove drainage from gall-bladder; "offensive" *vs.* "defensive" pus; value of *x*-rays in detecting gall-stones; correlation of patient's history with operative findings; table of gall-stones; behavior of gall-stones.

CLINICAL HISTORY OF PATIENT

A MALE, twenty-nine years of age, was admitted to Mercy Hospital November 30, 1915. The family history and the past history are negative.

The present malady began five months ago, on July 1st. The first symptom was a dull, lumbar backache, usually beginning about 6.30 P. M., and lasting until 10 P. M., and accompanied by a slight diarrhea. The pain became more severe and the diarrhea more profuse. Three weeks after the onset of the trouble there began a dull ache in the right upper quadrant of the abdomen, which was constant except when relieved by bowel action; and gas-distention of the abdomen, which caused great distress: much gas was passed by rectum. The patient's appetite began to leave him, food nauseated him, he began to lose weight, and became weak and pale.

Four months ago, on August 1st, the abdominal pain and distention suddenly disappeared. The bowel movements, however, increased from 6 to 15 a day: the stools were watery and clay-like, there being a yellowish sediment which settled to the bottom of a clear, watery fluid. The dysentery continued for seven weeks.

On September 22d, at midnight, there was an attack of severe pain in the lumbar region of the back, which lasted one-half hour. On September 23d and 24th the pain recurred at the same hour and again lasted one-half hour.

On September 25th the patient went to the hospital, and from that time until October 8th the backache continued to be very severe, but the diarrhea lessened.

On October 8th the liquid was changed to a solid diet, and about 8 P. M. the patient vomited for the first time, and during the next week vomited on four different nights.

On October 14th the patient vomited seven or eight times in from one and one-half to two hours: the vomitus consisted of yellowish, watery fluid, and was frothy and very bitter. It was not associated with colic.

On October 15th jaundice appeared. There was no chill or fever. The watery bowel-movements gradually stopped, although the patient still has frequent bowel-movements, which are semi-solid and very dark. There has been no pain since the onset of jaundice.

On October 20th the patient's appetite began to return. He gets very hungry and relishes all food except sweets, which seem to nauseate him.

During the past three months bowel-movements have averaged four or five a night, the bowel action always being accompanied by gas. The urine is very dark. The patient has lost 35 pounds since the onset of the malady.

On December 2d, two days after admission to hospital, the patient vomited 1½ drams of a dark fluid suddenly and without warning. Gastric lavage on that day produced a dark-brown fluid, and the next day, a clear fluid.

Examination by Dr. Murphy (December 6, 1915).—The gall-bladder is palpable; the liver is smooth and not nodular. There is a wood-like induration in the zone of the pancreas, extending clear across under the left costal arch. Of 13 skiagrams taken between November 25th and 30th, 6 were interpreted as showing gall-stones.

COMMENTS

Dr. Murphy (December 8, 1915): Jaundice that comes on without colic is not due to cholelithiasis. In this case it is difficult to interpret how much pain was present for the three days preceding September 25th. Was the pain severe enough to be

termed a cholelithic colic? The patient stated that he was not doubled up by the pain, and that the pain was in the loin; if the history is correct, there was jaundice alone, without frank cholelithic colic. Examination, however, is more suggestive than the history. Across the abdomen there is a mass of infiltration which is as hard as wood, as though malignant. Acute infection of the pancreas liberates steapsin, and this fat-splitting ferment gives rise to a wood-like induration which simulates carcinoma.

The diagnosis in this case is not cholelithiasis, therefore, but pancreatitis, or a neoplasm which is producing the obstruction to the bile-ducts and giving rise to jaundice. There is a definite law concerning jaundice which we laid down many years ago in our experimental work, namely, that if jaundice was not preceded by colic, the chances are 96 per cent. that it is not a cholelithic jaundice. If, on the other hand, the jaundice was preceded by colic or recurrent colicky pain, the chances are 90 per cent. that it *is* a cholelithic jaundice.

There is danger in operating upon this patient because of the presence of the intense icterus, which, however, does not give rise to so pronounced a tendency to bleeding as icterus due to a malignant lesion gives rise to.

Laboratory Report: Blood coagulation period is two minutes.

OPERATION

Note that I am making a small incision, because the operation must be primarily exploratory. . . . The whole wound oozes freely, although, according to the report from the laboratory, the coagulation time is two minutes. [Retracts wound.] . . . The gall-bladder is enormously distended, acutely inflamed, and firmly adherent. The pancreas is greatly enlarged and thickened far to the left of the median line; there are many enlarged regional lymph-nodes. [Frees adhesions and elevates gall-bladder.] . . . Is there a cholelithiasis which is producing the obstruction, or is the obstruction due to pancreatitis? I must take the tension off of the gall-bladder before being able to determine the presence of stones by palpation. [Aspirates gall-bladder.] . . . The bile is at first cloudy, but soon becomes thicker,

like glycerin, and comes out more slowly: it contains flakes of mucus which occasionally obstruct the needle; and finally there is purulent *brie* at the bottom of the gall-bladder. There are no stones in the gall-bladder, the cystic duct, or common duct—in complete accord with the clinical history.

Mechanically made diagnoses never take the place of those made with the cortical cells, as illustrated in this case—note the erroneous interpretation of the skiagram. The gall-bladder tells the story of acute infection with infiltration. This infection had been present a long time before it finally involved the head of the pancreas: note the history, indicating that the pancreatic lesion began September 25th and the gall-bladder infection took place July 1st. The indication to be met now is the relief of the cholemia, which, if it continues together with the sepsis, will eventually kill the patient. Had there been an organic obstruction, our plan would have been to "button" the gall-bladder to either the large or small intestine, but since the condition is entirely inflammatory, such a step is unnecessary. It was for the purpose of "coupling" the gall-bladder to the intestine that the button was originally brought out.

If the sepsis subsides, this gall-bladder will return to normal: I shall, therefore, perform cholecystostomy. That looks like a very badly wrecked gall-bladder, and I would perform cholecystectomy were it not that I wish to drain the pancreas through the gall-bladder. The drainage-tube will be retained for a long time. The cultures taken now will be negative, for the fluid in these viscera does not necessarily show a growth even in the presence of pus. In the experiments of Dudgeon and Sargent in connection with pus in the peritoneal cavity the analysis showed that from 50 to 60 per cent. of the pus taken from the peritoneum was sterile, meaning that the bacteria-laden polymorphs have been carried away. If, however, a piece of omentum is placed in a culture-tube, a growth immediately ensues, just as when, in this class of cases, if a section of the gall-bladder is ground up and cultured, a growth will be obtained.

I shall make a small incision into the gall-bladder and evacuate its contents. . . . The mucosa is very much thickened, and

the bile is too viscid and ropy to flow through the needle of the syringe: the thickest bile has, of course, gravitated to the lower end of the gall-bladder. [Introduces purse-string suture.] . . . This stitch acts as a constrictor to prevent the cut edge of the gall-bladder from bleeding into the organ itself. [Ties suture tight.] . . . I must now make the cut edges of this gall-bladder mechanically a part of the rubber drainage-tube, so that the latter cannot separate and get away. [Passes stitch through gall-bladder and tube on each side and removes both hemostats which held gall-bladder.] . . . Now we shall try to turn the end of the gall-bladder in and then insert the second row of sutures, or the second defense-line against leakage. [Inverts fundus of gall-bladder.] . . . See how nicely the fundus is turned in! As the gall-bladder rolls up, it folds the inner row of sutures down into the organ and makes an entropion of its edges. That is not enough security, however, for the gall-bladder must be bound to the tube: there will be no leakage from putting the needle through the latter. [Sutures gall-bladder to tube—for technic see vol. iv, October, 1915, Fig. 231, p. 903.] . . . Now there will be free and ample drainage of the pancreas. All the gauze sponges I have used are stained yellow, not from the bile in the course of my work, but from the secretion in the peritoneal cavity, which is yellow. [Closes abdominal wound, making usual ectropion of cut peritoneal edges and allowing room for drainage-tube.]

POSTOPERATIVE COMMENTS

The pancreas is enlarged to five or six times its normal size; it fills the whole upper abdomen; there are fat-necrosis flakes in the omentum and mesentery; there is no evidence of fluctuation in the pancreas. It is questionable whether this pancreas is capable of restoration; that is, whether it is not so necrotized by the infection that it will not again resume its function, in which case the patient will die.

We have a rather definite law when to remove these drainage-tubes: the gall-bladder will be drained until its mucosa ceases to resemble a granulated eyelid when seen through the cystoscope; thereupon the tube will be removed and the wound per-

mitted to close. So long as the granulated-eyelid condition persists, however, the infection has not been overcome.

In this case drainage must be continued for a much longer period of time, in the hope that it will drain the pancreas.

Many years ago, in writing the article on appendicitis, I used the expressions "offensive" pus and "defensive" pus. I made the point that in the peritoneal cavity the "defensive" pus was nothing more than a serous fluid filled with monomorphs and polymorphs—the quantity of pus cutting no figure whatever as to the presence or absence of living microörganisms. "Offensive" pus comes, for example, from a ruptured appendix, where there is offensive gangrenous material discharged from the appendix into the peritoneal cavity. Polymorphs are soldiers and build defenses against infection, and they are the real modern types of soldiers: when they get a microörganism, they treat him as a foe and not only kill, but also digest him.

Some one has asked me about the value of *x*-rays in detecting gall-stones. While fully appreciating the value of *x*-rays, yet I deem them only a support to the clinical history, and in the great majority of cases the diagnosis of gall-stone cannot be made with *x*-rays alone. As a result of his *x*-ray examinations, George, of Boston, through his superlative skill, is having a very large percentage of gall-stones show up in the pictures, and they are found with great uniformity at operation. It is estimated that when gall-stones are present, the *x*-rays will reveal them in about 50 per cent. of cases. But we know that one individual in every ten has gall-stones, and if one should interpret every case of upper abdominal symptomatology where gall-stones are found in the skiagram as "a gall-stone case alone," he will overlook an enormous number of other lesions which are associated in a patient with gall-stones. *X*-rays, therefore, should be employed merely as an adjunct and support to the clinical history, just as the reports of the pathologist and bacteriologist are mechanical aids which, in diagnosis, merely support the clinical course of the disease.

* * * * * * * * * * * * * * * * * * * *

Let us now see how the patient's history exactly fits the pathologic findings, and how it is at variance with the diagnosis

put on the board (cholelithiasis), to which I objected when I came into the amphitheater.

[Intern reads history again.] . . . That is the patient's own story: it fits exactly the pathologic findings. He had originally an infection of the gall-bladder without colic and with pain in the back; then he had an infection of the pancreas, which became greatly infiltrated and simulated carcinoma: the common bile-duct often passes through the head of the pancreas, and with an acute infection or a cancer of the pancreas the common duct may be occluded, giving rise to jaundice as one of the very common symptoms, but it is not preceded by colic.

Physical examination revealed a mass of wood-like hardness, transversely elongated across the abdomen and presenting a number of hard nodules at its upper and lower borders. On perpendicular finger-percussion over the gall-bladder the patient was very sensitive to pressure, showing merely that the organ was under tension. Then the question came up as to Courvoisier's law, which was laid down in the beginning of gall-bladder work away back in 1889: this law is to the effect that the gall-bladder is contracted in 80¼ per cent. of the cases of cholelithiasis with jaundice; while it is enlarged in 90½ per cent. of the cases of obstructive jaundice from causes other than gall-stones. We decided, therefore, that the patient was suffering from pancreatitis, which was sequential to infection of the gall-bladder; and that the icterus was due to the compression of the duct by the infected pancreas and to the edema of the duct which was sequential to the infection, and not due to biliary lithiasis, because, in my article in Sajous' "Encyclopedia" in the early nineties, I laid down the law that jaundice not preceded by colic is never a foreign-body jaundice, while jaundice which is preceded by colic *is* a typical foreign-body jaundice.

Colic never arises in the so-called malarial jaundice, although there are pain and discomfort. Colic never arises in the case of obstruction to the common duct from cancer of the pancreas, no matter how severe it may be: the duct may be compressed until it is almost entirely obliterated, but colic never occurs. *Colic is the manifestation of a foreign body in motion in a living tube.*

Thus a free stone in motion in the cystic duct gives rise to colic, but once it becomes stationary, as in a diverticulum, the colic disappears. There may be a stone in the common duct and no colic, but once the stone begins to move onward, then new manifestations arise in the shape of colic and cramp. There are a few exceptions to this rule, one of which is the large, wedge-shaped stone that becomes jammed in the duct, so that it does not give rise to colic. The stone may be an inch in diameter at the base and ¼ inch at the apex: such a stone was found in the case of a physician from Vancouver, operated upon by me in 1895, who gave a history of pain in the upper abdomen for a number of years and came in nine months after having had the jaundice. He was a young man about thirty-five years of age. I explained the law to him, adding that he presented an exception, for the stone in his case must be so large that it does not admit of spasm of the duct (colic), but he was not suffering from cancer notwithstanding that the obstructive jaundice came on without colic. At operation we removed a large, wedge-shaped stone which extended clear down into the common duct: the gall-bladder was contracted down to a little cicatricial mass.

TABLE GIVING DATA ON GALL-STONES

Two methods of formation:

1. Naunyn's septic.
2. Aschoff's aseptic.

Analysis of Bile:	(*a*) Liver Bile	(*b*) Gall-bladder Bile
Solids	2.060	16.020
Water	97.940	83.980
Mucus and coloring matter	0.276	4.438
Alkaline and bile salts	0.847	8.723
Taurocholate	0.106	1.934
Glycocholate	0.741	6.789
Fatty acids and soap	..	1.058
Cholesterin	0.078	0.870
Lecithin	0.028	0.141
Fat	..	0.150
Soluble salts	0.802	0.302
Non-soluble salts	0.020	0.236

Frequency: Roth, in Basle Pathologic Institute, in 16,025 necropsies from 1891 to 1910, found that 10.4 per cent. of all the bodies examined had gall-stones. Males, 5.9 per cent., and females, 15.25 per cent. Practically 1–7.

Etiology:

1. Bile stagnation.
2. Precipitation of cholesterin.
3. Accretions of bile salts.
4. Accretions of calcium salts.
5. Influence of infection.

Types of stones·

1. Pure cholesterin.
2. Coated cholesterin.
3. Calcium.
   a. The layer of calcium and cholesterin.
   b. The cholesterin pigmented and calcium.
   c. Bilirubin calcium.

Where are these gall-stones formed? Almost all gall-stones are formed in the gall-bladder. Ninety-eight per cent. by weight of all gall-stones is cholesterin, which is the product of dead epithelial cells lining the gall-bladder. In their formative stage gall-stones are soft and putty-like, and then they begin to crystallize suddenly, just as maple-syrup crystallizes. Each group of stones forms in practically the same shape: sometimes one can distinguish two or three crops of stones in the gall-bladder and deduce therefrom that two or three crops of crystals were formed.

Gall-stones are present in one individual out of every ten, but they produce trouble only when mechanically disturbed by irritating or obstructing a duct. An acute infection is what starts the gall-stones forming (Naunyn), so that gall-stones differ from urinary calculi, which are many times the precipitation of salts that have been in solution in the urine. Gall-stones begin to produce trouble first and most commonly in the gall-bladder —one has pain in the gall-bladder often without colic, and that pain may be recurrent for years; secondly, when the stone passes from the cystic duct and is larger in diameter than the lumen of the duct, it gives rise to typical colic not associated with jaundice; with a stone in the neck of the gall-bladder or cystic duct patients may have recurrent colic without jaundice for as long as thirty years; finally, when the stone has progressed far enough to escape from the cystic into the common duct, then for the first time jaundice occurs, and if the stone is large enough to produce obstruction, the jaundice continues as long as the stone

is in motion. The stone may be stationary, and if small, the bile may pass around it, the icterus slowly subsiding to a mild bronzing, which may be present with no bile in the urine for one, two, three, six, or even ten years until the stone begins to move again; now the cycle is repeated, the swelling from edema of the mucous membrane obstructs the passage of the stone, jaundice arises and may again subside after the stone is arrested.

At one time we believed that the icterus continued so long as the stone remained in the common duct. On the contrary, with the stone still in the common duct the icterus may entirely disappear, but there is the history of primary jaundice at the time the stone entered the common duct. I recall a patient from Tennessee who had been slightly bronzed for five years without ever having had colic: the bronzing began originally with severe jaundice. When we pinned her down to an accurate statement, however, she said that for four years preceding the jaundice she had had "gastralgia." Now we know that for years "gastralgia" was the regular name for gall-stone disease: that is what everybody called it. They figured that if she had gall-stones she would have to be jaundiced. You can now understand how one can have colics or pains for thirty years without having the stones get into the common duct, and how cholelithic jaundice never occurs unless the stones get into the common duct. As soon as the jaundice came the patient stopped having the "gastralgia," for when the stones leave the cystic duct and enter the common duct the "gastralgia" stops and the jaundice begins. At operation we found the common duct filled with stones. I wish to emphasize the fact that the pain stops when the stone ceases to move or obstruct: in this girl's case the colic stopped five years previous to the time of operation.

Postscript (*February 26, 1916*).—[Demonstration at Clinic.] This patient had an acute infection of the pancreas from the gall-bladder, producing the most intense jaundice I have ever seen: it was so intense that I felt he would bleed to death if we touched him, but the tissues did not bleed much, despite the cholemia. The pancreas was one solid mass of infiltration, and showed how severe the infection had been. There is practically

nothing left of the pancreas, for the other day we gave the patient olive oil, which was passed unchanged as olive oil, showing that there is no fat-splitting ferment left. We are giving him pancreatin, although we have not very much confidence in it, but at the same time we give it because it is supposed to have an effect.

He had recurrent diarrhea with no emesis, gradual emaciation, and notwithstanding the fact that we refed him his own bile, the marasmus continued and terminated fatally March 28, 1916.

CHRONIC CHOLECYSTITIS—PANCREATIC LYMPHANGITIS—METASTATIC ARTHRITIS—CHOLECYSTECTOMY

Summary: Clinical history of patient; comments—salient features of case presented by Dr. Mix; operation—correlation of symptoms and signs with pathologic findings; gall-bladder greatly infiltrated, suggesting malignancy; cholecystectomy; postoperative comments—review of pathology of gall-bladder.

CLINICAL HISTORY OF PATIENT

A FEMALE, fifty-nine years of age, was admitted to Mercy Hospital December 8, 1915. The family history reveals no tuberculosis or malignancy.

When a child, the patient suffered from intense jaundice for a long period of time.

During the past fifteen years the patient has been subject to attacks of indigestion, usually following a full meal: the chief feature of each attack was a "lump" which gathered just under the sternum on the right side; relief was obtained by self-induced vomiting, usually about two hours after the onset of the attack. The attacks occurred at intervals of three or four months. There was no distinct cramp-like or sharp pain in the region referred to. Chills and fever, nausea and vomiting, were absent, except as above stated. Blood was never vomited nor passed in stools.

In 1902, while cleaning a clothes-closet one hot afternoon, the patient was prostrated by a sudden attack of syncope, and for two days showed subnormal temperature. When recovering from this attack the patient noticed severe pain in the back of the head and neck, and a tender spot over the occiput on the right side, which prevented her from resting at night on that side. The headache was almost constantly present for two years, and was relieved by osteopathic treatment: the dizziness still persists, however.

In June, 1913, the patient noticed the left ring-finger beginning to swell at the proximal interphalangeal joint: the enlargement increased slowly for almost one year, when, in May, 1914, it rapidly increased in size, so that within one month it was four times as large as the corresponding finger on the right hand. The swelling of the finger subsided under treatment, but at present it is stiff at the proximal joint and cannot be fully flexed.

Since their onset the attacks of indigestion have continued at infrequent periods, but were not accentuated during the time the finger was enlarging. The patient is not subject to sore throat, but states that one tonsil is enlarged.

Early in May, 1915,—seven months ago,—there was a severe attack of indigestion characterized by cramp-like abdominal pain and by a sensation of distention which was so distressing that an anodyne was required. Four hours after the onset of the attack the patient obtained relief by vomiting a large quantity of bile after being given a hypodermic injection of apomorphin. Tenderness persisted over the upper abdomen for several weeks; there was no chill or fever, nor was the patient jaundiced.

A second attack occurred two months later, on July 4, 1915: it was quite similar to the one just described.

A third severe attack occurred four months later, on November 3d: the urine was very dark, and the physician stated that the patient's eyes were yellow. The attack lasted for one day and was relieved by emetic doses of apomorphin. Since this attack the patient has been very tender over the upper abdomen.

Last month the patient was operated upon for hemorrhoids which had been present for about ten years.

Within the past two months the patient's weight has been lowered by about 12 pounds; the appetite is fair; the bowels are greatly constipated and require a cathartic.

COMMENTS

Dr. Murphy (December 13, 1915): The patient's narrative spans a long period of time and possesses two salient features. First, the indigestion, with at times gall-bladder retention-signs,

but no signs of continued obstruction. The other feature is that of signs of intestinal intoxication with joint-manifestations from metastatic infection. The more recent signs point toward the gall-bladder as the seat of trouble. Dr. Mix has had the patient under observation for some time, so that I shall request him to discuss the history with you.

Dr. Mix: The history which I myself obtained from the patient varies in some essential details from that given by the intern. The most important omission is the story of a very intense jaundice when the patient was seven years of age. According to her story the icterus was of a malignant type, in that it was associated with a tendency toward the formation of black and blue spots on her body wherever she was touched. Cholemia of great severity tends to affect the walls of the veins to such an extent that diapedesis of the red blood-cells is extremely easy, and rupture of the vessel-wall by no means infrequent after the slightest trauma. She was intensely jaundiced for weeks, and her color was permanently changed. Before this jaundice she was a flaxen-haired blonde, but after the jaundice her skin took on a darker hue, which it has retained up to the present time.

The patient is inclined to place the beginning of her disturbance in the year 1900, when she began to be bothered with attacks of indigestion. The important point in the record of these attacks is that usually they were of *short periodicity*. They lasted only a day or a part of a day, and, as a rule, were the result of indigestion following a very full meal. After a full meal a "lump" seemed to gather under the sternum and to the right side. If the patient forced herself to vomit,—as she frequently did, by putting her finger down her throat,—she would be relieved of this lump, and the attack of indigestion would be over.

A second important feature is that at about this same time she was troubled with *signs of infection*. To be sure, there is no history of chills or of fever at this early date, but there is a history of attacks of very pronounced headache, which lasted for about two years up to 1902. Such headaches associated with attacks of indigestion of short periodicity, with a disagreeable feeling beneath the sternum, and to the right side, are fairly

suggestive—taking into consideration, furthermore, the early history of icterus—of biliary tract infection.

Substantiating this conclusion is the history of the absence of hematemesis or melena, and the *presence of bile in the vomitus*. Bile in the vomitus is a sign of a peritonitic irritation of the upper abdomen, and especially of the right quadrant. It means reversal in the direction of the peristaltic wave, which is reflex in origin, from a diseased or irritated peritoneum. It can occur in perigastritis, periduodenitis, and pericholecystitis. Biliary tract infections are very apt to lead to peritonitic irritation from involvement of the peritoneum about the gall-bladder. Frequently the gall-bladder becomes adherent to the adjacent structures,—especially to the duodenum and occasionally to the pylorus,—in which cases vomiting of bile is by no means unusual.

Still another point in the patient's history may be used to strengthen the diagnosis of biliary tract infection, and that is, the presence of vertigo. Usually in an individual fifty-nine years of age vertigo means arteriosclerosis, but if you recall the history, the vertigo appeared as far back as 1902. Vertigo appearing so early is apt to be due to causes other than arteriosclerosis, and is not infrequently associated with biliary tract infection. I should interpret the vertigo in this case as being due to disease of the biliary tract, rather than to chronic arteriosclerosis.

Aside from these preliminary remarks, which are somewhat conjectural, we have *three important seizures* of great diagnostic import. The first attack was in May, 1915. The patient told me that this attack came on about 12 o'clock midnight. It was associated with a very slight chilly sensation, but so far as she knows there was no fever. She was nauseated, but did not vomit until after a hypodermic injection of apomorphin. This induced vomiting, and aborted the attack after the latter had lasted for about two hours. No jaundice followed this attack, but she says that she did notice that she passed putty-colored stools about that time. She also noticed that she was tender over the upper part of the abdomen for several weeks following this attack in May.

The second attack occurred on July 4th. This, she remembers

distinctly, was associated with a pronounced chill and with slight fever. She also says that the physician who attended her noticed a trace of icterus appearing in the scleræ after the attack. This attack was also controlled by apomorphin, which, by causing her to vomit, emptied the stomach and aborted the attack.

The third attack occurred in October, 1915. This was very severe for one day, and was relieved by the hypodermic injection of a drug, the nature of which she does not know. This attack kept the patient in bed two weeks. Although the great severity of the pain was of only one day's duration, yet she was so prostrated by suffering that it was judged best for her to remain in bed two weeks. An indication of the amount of pain which she had at this time is the fact that she was burned with a hot-water bottle. This hot-water bottle not only burned the skin, but indicated to us pretty clearly where the pain was. The place of the burn is located beneath the right costal border and in the right flank. Evidently the pain was most intense in this territory. Following this attack in October she noted that her bowel-movements had a clay color on several occasions, but they were not constantly of clay color. There was also much tenderness beneath the right costal border, lasting for a period of eight weeks, following this attack in October.

When one takes into consideration these three attacks,—the first in May, the second in July, the third in October,—all similar in character and associated with very severe pain, relieved by vomiting,—induced on two occasions by apomorphin,—all associated with tenderness beneath the right costal border, two with putty-colored bowel-movements, one with a very slight amount of icterus in the sclerotic coats, there can be but one conclusion, and that is, that the patient is suffering from biliary tract infection.

There is another symptom of very great importance to be mentioned, and that is that in June, 1913, the ring finger of the patient's left hand in the joint between the middle and proximal phalanges began to swell until in one month it was twice the size of the corresponding finger on the right hand. The patient, who is a woman of means, consulted several physicians in regard to

this joint-trouble, and received various diagnoses. By one surgeon a diagnosis of sarcoma was made, and it was proposed that the finger be amputated at once in order to prevent a subsequent necessary amputation of the whole hand or arm. Another surgeon suggested that it was arthritis of intensity great enough to require resection of the joint. She objected to this because she did not want her finger to stick out like a poker. She thought it was better to have it remain larger and capable of being bent, rather than to be reduced in size and kept stiff. She, therefore, refused to have anything done. The finger looks like an ordinary dactylitis, on either a tuberculous or syphilitic basis. A Wassermann examination was found to be negative. A tuberculin test also turned out negative. There remained only one conclusion, and that was that this joint-disease was associated with some focus of infection somewhere in her body. Indeed, it was this joint-disease which led to the discovery of the gall-bladder trouble, because it was the joint-disease which brought her to my office and which led to an investigation of the case. Evidently the joint—since it had proved to be neither tuberculous nor syphilitic—was gouty or metastatic. On the theory that it might be gouty she was examined very carefully for gouty manifestations elsewhere, but none was found. On the theory that it might be metastatic she was examined for signs of disturbance elsewhere, and then the gall-bladder history was discovered.

Physical examination shows no tenderness over the appendix. There is no history, nor any element pointing to disease of the appendix at any time in the patient's life. The urine at the present time shows a trace of bile,—indicating the existence of biliary tract infection,—normal color and normal specific gravity, and the absence of albumin, sugar, casts, and red cells. There is no history of disturbance on the part of the stomach, except such disturbances as occurred at the time of the biliary seizures. When her gall-bladder trouble is latent, she never has any gastric disturbance. There has never been pain between the attacks in May, July, and October, either in the duodenal area or in the epigastrium. The entire freedom from disturbance on the part

of the stomach between these very short storm-periods certainly evidences the absence of ulcer of either the stomach or duodenum.

Inasmuch as there is no evidence of appendicitis, so far as physical examination or history is concerned; since there is no evidence of gastric or duodenal ulcer in the history or in the results of physical examination; and since there is a focus of infection, as shown by the slight chilly sensations, occasional fever with headache and vertigo, short periods of painful activity and comparatively long periods of freedom from trouble, no history of hemorrhages, but three important painful seizures of short duration occurring in May, July, and October, we are forced to the diagnosis of biliary tract infection, with or without gall-stones. As we have no history which points to clear, colic-like attacks of pain, we are not justified in diagnosticating the existence of gall-stones. The duration of the case, however, as well as the intensity of the biliary tract infection, suggests that stones are present, rather than absent.

OPERATION

Dr. Murphy: Dr. Mix's interpretation of the symptoms and signs is exactly in consonance with the pathologic facts as revealed by our incision: the gall-bladder reveals the typical stippling of infection and is firmly bound down to the pylorus. [Frees gall-bladder from adhesions to pylorus.] . . . The stomach reveals neither ulcer nor beginning cancer. There is no calculus in the biliary tract, but there is a slight thickening of the head of the pancreas. The gall-bladder is so badly diseased that it does not resemble a gall-bladder: this infection probably accounts for the metastatic joint-infection. The gall-bladder feels suspicious: its walls are so thickened by infiltration as to suggest malignant degeneration. [Performs cholecystectomy.] . . . Upon opening this gall-bladder we find that the mucosa is not malignantly infiltrated, so that the thickening of the organ itself is probably the sequence of infection, since carcinoma is always a primary lesion of the mucosa. The infiltration has extended into the liver. [Cauterizes stump of cysticus with 95 per cent. phenol.]

This gall-bladder was infiltrated to the superlative degree:

as soon as you look at it you do not wonder that metastatic arthritis and rheumatism arose from it as the primary focus. I feel greatly relieved that the infiltration is inflammatory and non-malignant in type. [Applies and secures drain to stump of cystic duct.] . . . If the duct begins to leak bile,—as it sometimes does,—we may rest assured that good drainage has already been established. The firm binding of the gall-bladder to the pyloric zone of the stomach accounted for the recurrent obstruction-retention without an organic obstruction. To prevent reformation of these adhesions I am covering over the abraded surfaces with the gastrohepatic omentum. . . .

The post-operative fixation of the pyloric zone of the stomach to the liver seriously interferes with the patient's comfort following cholecystectomy; and it is for that special reason more than any other that we are not performing more cholecystectomies.

POSTOPERATIVE COMMENTS

The clinical history of this patient may readily be correlated with the pathologic findings. The thirteen or fourteen years of gastric disturbances, for example, were due to infection, fixation, and obstruction of the gall-bladder: gall-stones do not do the mischief themselves, but it is the pathologic changes induced by the gall-stones. Every gall-stone is primarily an infection-sequence—that is, the stones are formed from infection of the gall-bladder (Naunyn); these foreign bodies, by their presence in a more or less infected zone, keep up a continued production of cholesterin, which, in turn, keeps increasing the number of stones until finally there is the arrest of the microörganisms of a more virulent type, which start up suppuration in the gall-bladder. This patient's gall-bladder contained pus as well as *brie:* such a white gall-bladder always results from infection. The virulence of the infection was spread over a long period of time, and the ensuing pathologic changes caused the gall-bladder to contract as much as possible upon its contents.

This cicatricial contraction of the gall-bladder consequent upon infection accounts for that part of Courvoisier's law which

states that the gall-bladder is contracted in 80¼ per cent. of the cases in which the common duct is obstructed by stone.

When the ligature on the cystic duct cuts through,—usually on the sixth or seventh day,—there is a leakage of bile for some days: I consider this a fortunate, rather than an unfortunate occurrence, for it aids in the drainage of the pancreatic zone.

Pathologist's Report.—Examination of the gall-bladder revealed total destruction of the mucosa by a chronic inflammatory process with much connective-tissue reaction. There were small hemorrhages with edema in the layers of the wall. *Cholecystitis chronica* with ulcer-formation: no malignant changes in region of ulcers.

Postscript.—The patient made an uneventful recovery and left the hospital within the usual time.

CHOLELITHIASIS, PANCREATITIS, APPENDICITIS—CHOLECYSTOSTOMY, APPENDECTOMY

Summary: Clinical history of patient; comments—rôle of appendiceal sepsis in etiology of gall-stones; sites of formation of gall-stones; operation—stones in gall-bladder, pancreas enlarged; cholecystostomy, appendectomy.

CLINICAL HISTORY OF PATIENT

A MALE, forty-seven years of age, was admitted to Mercy Hospital January 5, 1916. The family and past histories are negative.

During the past twenty years, at intervals of one year, in addition to headaches, the patient has had griping pains in the right lower quadrant of the abdomen: the pains were followed by nausea and vomiting, tenderness over the lower abdomen, and fever; the patient was incapacitated for several days, and each attack was followed by constipation.

Six months ago, in July, 1915, the patient had a sharp attack of pain, which began near the navel and gradually radiated to the right iliac fossa: the pain was so severe that it doubled him up, and he was given a hypodermic injection of morphin; fifteen minutes later he became nauseated and retched, but did not vomit. Fever came on, and the patient had a severe chill: he remained in bed three days and then felt fairly well.

Eight weeks ago, on November 12, 1915, the patient was awakened by a sharp cramp in the lower abdomen, which gradually radiated around to the right iliac fossa: the cramp was followed by nausea and vomiting, and at the end of half an hour by a chill and fever of 101° F. He was treated with cold compresses and medicines for one week when, on November 19, 1915, he had another severe attack of abdominal pain, localizing in the

right iliac fossa, with nausea and vomiting, chills and fever: his abdomen was distended and very tender, and he passed neither flatus nor feces; he was very deeply jaundiced and his urine was dark. The next day he was operated upon: a large appendiceal abscess was incised and drained; the appendix was not removed; after a week's drainage the wound healed.

One week ago, on December 29, 1915, the patient had a sharp cramp in the right upper abdominal quadrant, which was so severe that it doubled him up. The cramp gradually diminished in intensity and became dull and aching. The patient was distended and very tender over this region. He had no chill or fever, but his conjunctivæ showed slight jaundice. The next day the stools were clay-colored and putty-like, and the urine was very dark: later the patient became very much jaundiced. Similar attacks, attended with slight fever, occurred three days and two days ago, and on the day of admission.

COMMENTS

Dr. Murphy (January 11, 1916): It is now five days since the patient had his last attack of colic, and since then his jaundice has very materially cleared up, so that we hope the stone, which we presume to have been in the common duct, has left that duct.

I should like to inquire what rôle the sepsis from the appendix, which he has had for a number of years, played in the production of the gall-stones. For a long time it was believed that gall-stones were always the sequence of infection, but we are left in doubt by the more recent experiments of Aschoff, who concludes that stones are formed, without infection, from the cholesterin from the dead epithelial cells of the gall-bladder.

Most gall-stones are formed in the gall-bladder: occasionally one is formed in a diverticulum or a small dilated intrahepatic duct. Courvoisier reported finding a large number of gall-stones in the hepatic duct; but these stones were, in fact, formed in the gall-bladder and were forced into the hepatic duct during the contraction of the gall-bladder because the common duct was obstructed by a larger calculus.

In an article entitled, "Intrahepatic Cholelithiasis," Lewisohn (*Annals of Surgery*, May, 1916, 535–540) writes:

"The question of the formation of intrahepatic stones is of the greatest interest to the surgeon. Every surgeon will experience cases where, after a previous cholecystectomy and a thorough removal of common duct stones, he has to reoperate on account of jaundice. At the second operation, he again finds stones in the common duct. The question then arises: Were these stones overlooked at the first operation? . . . The stones removed from the hepatic ducts differ absolutely in shape, color, and character from the stones found in the gall-bladder. . . . *It is therefore beyond doubt that intrahepatic stones can be and are formed in the liver.*" [Italics ours.] (See Figs. 81, 82.)

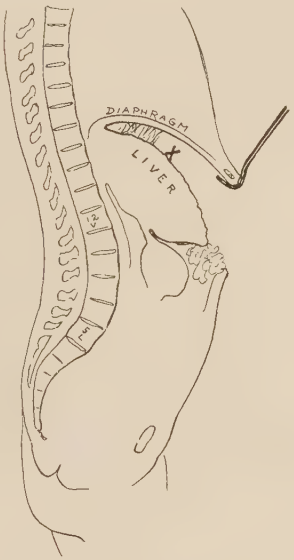

Fig. 81.—Diagrammatic side view. X, Removal of intrahepatic stones from the diaphragmatic surface of the liver (Lewisohn in *Annals of Surgery*).

It has not been an uncommon experience to have gall-bladder symptoms with or without infections manifest themselves shortly after acute attacks of appendicitis. Dr. C. H. Mayo's case was a striking one of that type.

OPERATION

[Celiotomy through vertical incision in outer portion of right rectus muscle above navel: edges retracted.] . . . The gall-bladder is non-compressible, thickened, and white: there is a stone impacted in the cystic duct, which we have succeeded in pressing back into the gall-bladder. The head of the pancreas is infiltrated and contains quite a notch: this infiltration interferes with exploration of the common duct for stone. [Unsuccessful attempt made to aspirate gall-bladder: incision then made through fundus.] . . . The bile is thick and viscid and con-

tains millet-seed stones, so that aspiration was futile. I am removing several stones with the spoon, as well as a large quantity of thick, rope-like bile. . . . Exploration of the common duct reveals no stone. [Performs cholecystostomy in the manner described above on p. 405.] . . .

On November 20th the patient was operated upon for appendiceal abscess, but the appendix was not removed. We shall take

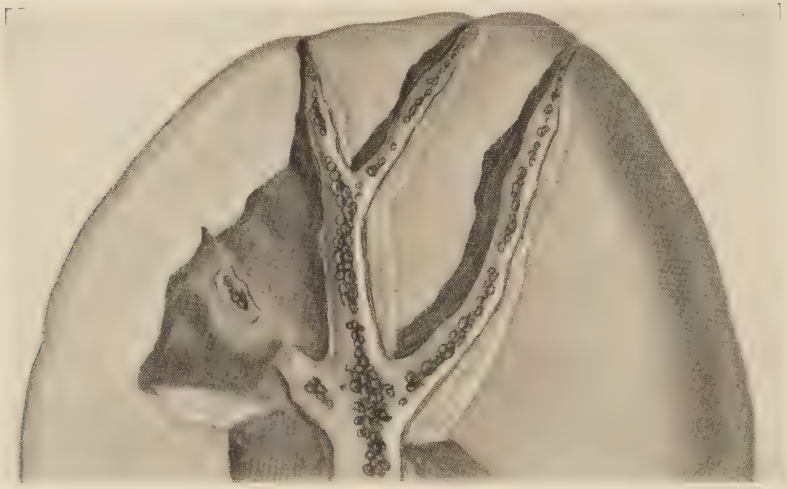

Fig. 82.—Postmortem specimen illustrating intrahepatic cholelithiasis (Lenhartz).

advantage of the present opportunity of removing the organ, for if we do not, the chances are that we shall have to remove it subsequently during an attack. [Exposes appendix; encounters firm, dense adhesions; stump of chronically diseased appendix was removed; sponges and instruments accounted for; celiotomy wound closed with allowance for exit of drainage-tube.] . . .

Postscript (*January 28, 1916*).—The patient's condition is splendid: his convalescence has been uneventful.

CARCINOMA OF CHOLELITHIC GALL-BLADDER—EXPLORATORY CELIOTOMY

Summary: Clinical history of patient; comments—question of the girdle-pains of tabes; table showing useless surgical operations in tabes; review of history; diagnosis of palpated nodule; operation—exploratory; postoperative comments—"silent" gall-stones; primary sarcoma of gall-bladder.

CLINICAL HISTORY OF PATIENT

A FEMALE, fifty-three years of age, was admitted to Mercy Hospital January 22, 1916. The family history is negative. Nineteen years ago, when seven months pregnant, the patient suffered an attack of typhoid fever, which lasted six weeks. She has also been operated upon for hemorrhoids.

One month ago, on December 23, 1915, the patient had a severe, sharp cramp in the right upper quadrant of the abdomen, which radiated around to the back and upward to the right shoulder: it was not severe enough to double her up, and after about two hours gradually subsided into a dull ache. She had neither fever nor chill; did not feel nauseated; did not vomit, nor was she jaundiced after the attack. The stools the next day were of normal color and consistency—not clay-colored—and contained neither mucus nor blood. The dull ache in the right upper quadrant continued.

Three days later, on December 26th, there was another similar attack of pain, which was relieved by medicine, but which left in its wake tenderness over the right side of the epigastrium: even the pressure of the bed-clothing was annoying.

Four days later, on December 30th, she had another attack of pain in the epigastrium which lasted all day, and which was followed by a dull, aching, dragging sensation, radiating toward the shoulder. The stools were normal, and the bowels moved every other day.

These attacks repeated themselves at intervals of about two or three days up to the present time. The patient has had no fever, nor has she been jaundiced, although the conjunctivæ have a subicteric tinge at present.

The patient has seven children living and well. One baby was stillborn at seven months: no history could be obtained of sore throat, rash, alopecia, or nocturnal headaches. The pupils react to both light and accommodation; the Romberg sign is negative; both knee-jerks are present.

COMMENTS

Dr. Murphy (January 27, 1916): Notwithstanding the stillbirth there is nothing to confirm the suspicion of lues, or that these pains are the girdle-pains of tabes—the common lesion for which celiotomies are performed unnecessarily under the mistaken diagnosis of gastric or duodenal ulcer, gall-stones, or appendicitis. In some cases of tabes one has the clinical history to rely upon, but the cases which are hard to differentiate are those in which the inaugural symptoms are gastric crises. One may have any of the abdominal lesions mentioned and still have a plus von Wassermann reaction complicating the diagnosis, but in the majority of cases the latter is easy once tabes is suspected.

USELESS SURGICAL OPERATIONS IN 1000 CASES OF TABES DORSALIS. —(*Nuzum.*)

Surgeon's Diagnosis	Number of Operations
Gastric ulcer	19
Gall-stones or cholecystitis	19
Appendicitis	18
Salpingitis	13
Exploratory laparotomy	9
Renal calculi	7
Postoperative adhesions	7
Tumor of cauda equina	1
Sciatica (nerve stretching)	1
Meningocele	1
Ectopic gestation	1
Peritonitis	1
Total number of operations	97 (9.7 per cent.)

This patient presented no history of a lesion in the right upper abdominal quadrant previous to the gall-stone pain which occurred just one month ago, and the two major attacks in the interim were typical in the pain radiating toward the shoulder and followed by nausea and vomiting and sensitiveness in the right hypochondrium: on admission to hospital she was still somewhat sore, but not so sensitive as one might expect from a recent attack. She had, however, on examination an apparently normally flexible liver-margin; but a little to the right of the umbilical notch a hard nodule the size of the thumb projects below the edge of the liver: the latter is flexible above and below the nodule. The patient's history of typhoid fever suggests an etiologic factor in the production of gall-stones, and from our observations it is the commonest cause; appendicitis, also, is an etiologic factor.

The nature of this hard nodule is conjectural: Is it a single stone lodged in the fundus of the gall-bladder or in a diverticulum? Is it the gall-bladder filled with stones? Or is it a neoplasm? Cancer of the fundus of the gall-bladder is, we believe, the sequence of frequent irritations; but cancer of the gall-bladder is such a rare disease in proportion to the number of gall-stone cases that if stones are the etiologic factor it is surprising that they do not produce this evil result more frequently.

OPERATION

[Celiotomy through outer margin of right rectus muscle above navel: wound-edges retracted.] . . . The nodule which we felt is the gall-bladder, enlarged, hard as wood, and full of gall-stones. The liver above the gall-bladder is as hard as wood and the regional lymph-nodes are enlarged and hard. The stomach and other abdominal viscera are uninvolved. In view of these cancerous findings it would be futile to remove the gall-bladder or perform any other type of radical operation. [Specimen removed from liver for pathologic examination; instruments and sponges accounted for; wound closed without drainage.]

POSTOPERATIVE COMMENTS

There is nothing in this patient's history to lead one to believe that the gall-stones had existed for such a long period of time: not one gall-stone case out of one hundred in which the stones have been confined to the gall-bladder shows anything in the history that indicates the presence of stones. When cancer involves the fundus of an organ, there are few or no manifestations of its presence; but when it involves the neck or outlet, the opposite obtains.

A case somewhat similar to ours in clinical history and operative findings, but which proved to be primary *sarcoma of the gall-bladder*, was reported by Carson and Smith (*Annals of Surgery*, December, 1915, 688): cholecystectomy was performed, and the part of the liver invaded with tumor tissue was removed with the gall-bladder. The patient died four days after operation.

This is the ninth well-authenticated case of primary sarcoma of the gall-bladder which has been reported, although this disease may be of more frequent occurrence. In one of Landsteiner's cases there existed in the gall-bladder, besides the sarcoma, an epithelioma which had arisen as a metaplasia of the mucous membrane and was invading the deeper structures of the wall. There is a curious tendency in some of the tumors to grow in the direction of the cystic duct. Invasion of the substance of the liver is common, even in the case of small tumors: the involvement of the liver by an extension of the growth from the gall-bladder may become very great. Gall-stones were found in all cases except one.

Postscript.—There was primary union. The patient progressed uneventfully to recovery.

(For bibliography of cases of biliary calculi previously published in the CLINICS see vol. iv, December, 1915, 1143.)

PYLORIC OBSTRUCTION FROM CICATRICIAL BAND—RELEASE; OBLITERATIVE APPENDICITIS—APPENDECTOMY

Summary: Clinical history of patient; comments—analysis of history; the diagnosis of juxta-pyloric ulcer; order of symptoms in duodenal ulcer; operation—a cicatricial band found obstructing pylorus and angulating stomach: band dissevered; no ulcer found; obliterative appendicitis—appendix removed.

CLINICAL HISTORY OF PATIENT

A MALE, twenty-nine years of age, was admitted to Mercy Hospital November 18, 1915. The family and past histories are negative.

Two years previously, in December, 1913, the patient began to suffer from belching of gas and regurgitation of sour material within two or three hours—and often immediately—after eating. There were pain and occasionally nausea, but rarely was there vomiting. He was troubled throughout the winter, but improved in the spring and remained fairly well throughout the summer over a period of six months, when the stomach distress returned: it has persisted up to the present time.

The belching and regurgitation have been becoming gradually worse, while within recent months the pain has given way to a severe gnawing and burning discomfort in the stomach, which is most marked from two to three hours after meals: this discomfort affects also the esophagus and pharynx; there is neither sharp pain nor vomiting. Heartburn occurs from two to three hours after each meal, and often awakens him at night—as late as 4 or 5 A. M.: it is relieved by eating, but returns from two to three hours after the relief-food is ingested.

Blood has not been noticed in the stools. There are occasional attacks of diarrhea, which last from a day to a day and a

half. The patient has not been jaundiced: he has not lost weight.

COMMENTS

Dr. Murphy (November 20, 1915): This patient's malady began in December and continued throughout the winter: in the spring it disappeared and remained quiescent until the next fall, when it returned, and since then it has continued up to the present time. He has symptoms of distress after meals, followed by food-relief. The disease comes on in the fall, is better in the summer, becomes worse again in the winter, and finally becomes continuous: there is the presence of a little blood in the gastric lavage. Has he duodenal ulcer, gastric ulcer, chronic (obliterative) appendicitis, or gall-bladder disease?

In all these cases one must make his diagnosis on the patient's story, rather than on the physical examination, for the latter always leaves an element of uncertainty as to the diagnosis. While patients frequently relate the same story of the same lesion, yet the history is fairly uniform if you keep asking it over and over again. In many cases of duodenal ulcer the history is fairly clear and accurate—so accurate, indeed, that one can establish the diagnosis on the basis of the history, particularly if he has had the patient under observation for a long time.

I notice sitting here in the arena Dr. Torpey, who lives in a small town in Iowa of 2800 inhabitants: at different times he has referred cases of gastric and duodenal ulcer to me,—I think five within a very short time,—and in each case he made a positive diagnosis as to whether it was gastric or duodenal ulcer, and in every case the diagnosis was confirmed at operation. The fact that five cases occurred in such a comparatively short time in one physician's experience alone in a small town of 2800 inhabitants emphasizes the frequency of juxta-pyloric ulcer. An enormous percentage of these cases is overlooked and diagnosed as hyperacidity: one of the handicaps in an operating clinic is that we must establish the diagnosis from the patient's history, instead of from seeing him in an acute attack, when it is comparatively easier to make the differential diagnosis.

This is not a clean-cut case, but one in which a large interrogation point should be placed after the preoperative diagnosis. The usual order of symptoms in duodenal ulcer is, first, that the greatest pain comes on from two to four hours after meals; secondly, belching from the large quantity of gas which gathers; thirdly, temporary food-relief; that is, upon the intake of additional food during the seizure. In this case food-relief was not a striking symptom, since the patient had not carefully observed it; however, by merely asking him on what occasions he took food-material for relief and what he took, we were able to draw the conclusion that he had some kind of food-relief: he did not give the clear history of food-relief which so many patients with duodenal ulcer give, but he gave the symptoms of gastric retention, which is confirmed by skiagram.

OPERATION

[Celiotomy incision placed through outer portion of right rectus muscle above level of navel: the muscle was not divided, but was drawn inward; wound-edges retracted and exploration begun.] . . . I am examining first the pyloric zone of the stomach, because 84 per cent. of all cases of gastric ulcer involve that zone. There is hyperplasia of the muscular tunic of the stomach, showing that there has been an obstruction to the outlet. There is no palpable evidence of ulcer at the pylorus: this indicates that at least it is not the chronic indurative type of ulcer that exists in the stomach. The stomach is suspended at a sharp angle, which is due to a sharp band binding it at the outlet: this band passes up to the transverse fissure of the liver, and is so strong that the patient may be lifted from the table by it. [Dissevers the band.] . . . Now the stomach is free and can be brought up into the field without any difficulty. The duodenum is dilated beyond the usual degree, but shows no scar on its dorsum, which is the commonest site of duodenal ulcer. Neither a gastric nor a duodenal ulcer is present to account for the cicatricial band. The gall-bladder is fairly readily compressible, contains no stones, and is free from adhesions.

It remains to inspect the appendiceal zone. . . . The

ileum is brought into the field without traction, showing the absence of a Lane kink. On dislodging the caput coli, we find the appendix passing through a slit in the mesoappendix and buried in a pocket behind the peritoneum: its lumen is narrowed at its base, and the organ is infiltrated at its end. [Appendix removed by usual technic; instruments and sponges accounted for; peritoneum closed by making ectropion of edges; posterior sheath of rectus sutured; rectus muscle allowed to fall back into place; anterior sheath accurately sutured; skin closed without insertion of drainage.] . . . The atypic history justifies the atypic findings.

Postscript (*January 11, 1916*).—The patient has had no further gastric distress and is feeling fine.

ULCER OF DUODENUM AND OF JEJUNUM—ANTERIOR GASTROJEJUNOSTOMY BY OBLONG BUTTON METHOD

Summary: Clinical history of patient; comments—analysis of history; operation—exploration and findings; selection of type of anastomosis depends upon pathologic findings; antecolic (anterior) gastrojejunostomy performed with oblong button.

CLINICAL HISTORY OF PATIENT

A MALE, sixty-two years of age, was first admitted to Mercy Hospital January 29, 1915. The family and past histories are negative.

During the past fifteen years the patient has suffered from "dyspepsia," which was characterized by a sensation of heaviness and burning in the throat, belching of gas, nausea and vomiting, and constipation.

During the past four years this "dyspepsia" has been worse. The patient has pain from one to three hours after eating, which is relieved by belching; the nausea and vomiting come on from two to three hours after meals, and vomiting of sour material gives relief: gastric lavage also gives relief. At no time has the patient vomited blood nor passed blood in the stools. These attacks occurred monthly during this period.

On January 12, 1915, before eating supper the patient had a sensation of distress in the epigastrium, which twenty minutes later was followed by pain, then nausea and vomiting: he vomited everything he had eaten for two days; the vomiting lasted four hours, with intermissions of from five to ten minutes. The pain was dull in character, but required a hypodermic injection of morphin: it lasted throughout the night, until the anodyne was administered. Two days later, after partaking of a light meal for the first time, the patient vomited twenty minutes later. The next day he ingested some oatmeal, and four hours later some barley-water; three hours after taking

the latter he vomited both oatmeal and barley-water. He has not been able to eat anything since, and even a little water makes him vomit immediately. He has never passed a stone, gravel, or blood in the urine. He has never been jaundiced, nor has he had colicky pains. The stools are normal.

The patient became rapidly emaciated, declined operation, and was put on a course of medical treatment for duodenal ulcer. He regained his health and almost his full weight, and was discharged from hospital March 12, 1915—a striking example of a medical cure.

The second admission was on December 19, 1915. After the previous discharge from hospital the patient remained free from symptoms for six months, when there appeared loss of appetite and sensation of distress in epigastrium after meals, eructations of sour material, and loss of weight. These symptoms continued until the latter part of September, when there began a burning sensation in the abdomen twenty minutes to one hour after eating, and eructations of sour material, which usually relieved the discomfort.

On October 1st the patient was awakened about 12.30 A. M. from a sound sleep with a scalding pain in the epigastrium: he induced vomiting, which brought forth a large amount of greenish fluid and food ingested at breakfast and at the other two meals; the vomiting relieved the pain.

After October 1st the pain recurred between 12 and 12.30 every night. On December 15th—four days before admission—the patient was awakened about 10 o'clock in the evening with a sharp cramp in the upper abdomen, which extended entirely across, but no severer on the right side than on the left: the pain lasted about twenty minutes, when the patient was given bicarbonate of soda, which induced vomiting and relieved him. There was considerable soreness all over the upper abdomen for ten days after this attack. The next day the bowel movements were black and tarry, but by the end of two days the stools had regained their normal color: during this time the patient did not faint or feel dizzy, nor did he have palpitation of the heart or black spots before his eyes. There was no chill or fever or vomiting of blood.

On account of pain and vomiting caused by eating, the patient gradually became weaker from the lack of food: he lost ten pounds between October 15th and the time of admission.

On December 19th, at 10 o'clock in the morning,—shortly after admission to hospital,—the patient vomited nearly ½ a pint of coffee-colored material: this was sent to the laboratory and proved to be blood.

Examination by Dr. Murphy (December 10, 1915).—No abdominal tumor is palpable, nor is there any tenderness of the abdomen. Skiagrams reveal obstruction to the outlet of the stomach and involvement of the gall-bladder. The patient was advised to be operated upon immediately, but preferred to postpone operation until after the holidays.

COMMENTS

Dr. Murphy (January 31, 1916): The patient gives a history of gastric disturbances extending over a period of fifteen years, with periodic attacks coming on about once a month. With the attacks he had pain in the epigastrium coming on from one to three hours after meals: the pain was relieved by vomiting, but not relieved by the further intake of food. One year ago he had an attack of acute epigastric pain, soreness in epigastrium, and black, tarry stools, but no hematemesis.

In December, 1915, he had the evidence of near-perforation in his upper abdomen, with nausea and continued soreness for a long period of time after the acute pain.

After leaving hospital on December 10th he was home just one week when he was taken with another severe attack, and was readmitted to hospital December 19th, since which time he has been under preparatory medical treatment.

Our diagnosis is duodenal ulcer with attempts at perforation and sequential adhesions, etc.

OPERATION

[Celiotomy incision placed through right rectus muscle above level of navel; wound-edges retracted.] . . . As we explore the upper abdomen we find that the gall-bladder empties easily,

but is adherent to the duodenum. The under surface of the arch of the duodenum is involved in an extensive inflammatory induration, which indicates the site of a duodenal ulcer. In chronic ulcers in this situation the pylorus forms the Great Divide: if the ulcer is on the gastric side of the pylorus, it is liable to undergo malignant degeneration in a certain percentage of cases; while if on the duodenal side, such a liability is rarely manifest. . . . There is another ulcer in the first portion of the jejunum, causing slight stenosis: this is but the second ulcer which I have seen in this situation. . . . The head of the pancreas is not thickened. There are infiltration and a chronic inflammatory condition over the whole surface of the pancreas, and much thickening and shortening of the transverse mesocolon from scar-tissue, showing the result of peritoneal infection at the time of attempted perforation of the ulcer.

From study of the living pathology it is evident that the ulcerous condition has been present for a long time and has been getting worse. The proximal ulcer extends from the pyloric zone out into the duodenum: it had attempted to perforate, but adhesions formed from repeated attacks of peritonitis, leaving scar tissue, which represented the efforts of nature to keep the ulcer from opening into the free peritoneal cavity. These very adhesions, however, are so situated as to prevent our performing gastrojejunostomy by the retrocolic or posterior route: we shall, therefore, employ the antecolic, or anterior route, with a loop of from 18 to 20 inches in length, using our oblong button for the anastomosis.

[Performs gastrojejunostomy in accordance with technic already described in vol. v, February, 1916, 24.]

Postscript (*February 27th*).—The stitches were removed on the fourteenth day: there was complete primary union. The patient passed the button on the seventeenth day. On discharge from hospital he was in splendid condition.

April 3, 1916.—The patient reports that he is much improved, and that he feels quite well and looks well. His appetite is fine, and he sleeps soundly. Weight, 168½ pounds.

[The bibliography of duodenal ulcer was published in this volume, February number, page 26.]

OBTURATION ILEUS—RELEASE BY DISSEVERANCE OF BAND—TALK ON INTESTINAL OBSTRUCTION

Summary: Clinical history of patient; emergency operation—band obstructing small intestine was found and dissevered; postoperative comments—nature of the lesion; postscript—talk on intestinal obstruction.

CLINICAL HISTORY OF PATIENT

A FEMALE, twenty-four years of age, was admitted to Mercy Hospital January 10, 1916. The family history reveals that the patient's mother died from "perforation of the bowel" when sixty-nine years of age, and that one brother died from pulmonary tuberculosis.

Nearly five years ago, in May, 1911, the patient complained of a dull ache in the pelvis, especially on the left side: she was not menstruating at this time. Soon there began slight afternoon fever, which quickly led to a continuous fever of from 101° to 102° F.

On May 28, 1911, the patient was attacked by severe, excruciating abdominal pain which was diffuse throughout the abdomen, but most marked below the navel. On examination the abdomen was found distended and very tender; there was fever of 103°–104° F. She was operated upon that same evening: a pus-tube was removed and drainage instituted. The drainage-tubes were removed five days later, on June 2d, and the wound healed within fifteen days.

Since the operation the patient has maintained a fairly good state of health. There was a tendency toward constipation, which was warded off by cathartics. She suffered from gas-discomfort in the region of the sigmoid flexure.

Sixteen days previous to admission, on December 25, 1915,

the patient was attacked by violent generalized abdominal cramps, which were wave-like and recurred two or three times a minute, and felt as though the bowels were trying to overcome an obstruction. There was no vomiting or fever. The abdomen was tense, tender, and distended with gas. The pain was severe enough to require an anodyne, which afforded relief. There was no bowel movement, and no gas was passed.

The next day the patient was given a high enema, and very little feces and gas came away. The patient took and retained some nourishment. The pains continued and required two more doses of morphin for relief. The stomach was washed out, but the abdomen remained distended and tense. This condition continued for about two weeks: high enemata were administered daily and resulted in some small amounts of feces and flatus.

On January 7th the patient was feeling somewhat better. An enema was administered and brought away considerable gas and feces.

On January 8th the pains returned—this time severer than at any previous time. In the evening the patient vomited a small amount of greenish slime: the next morning the physician washed her stomach out and recovered fecal matter. She was admitted to hospital the next day.

Examination by Dr. Murphy (January 10th, 12 M.).—The patient's skin is cyanotic. Stomach washings reveal about two ounces of very offensive material. On superficial percussion there is slight flatness in the right iliac fossa: elsewhere throughout the abdomen there is great resonance; peristaltic waves can be seen passing along the bowel, culminating in the right iliac fossa, under the scar of the previous operation.

The stethoscope revealed stormy borborygmus, with the explosions occurring at the end of each wave just beneath the scar in the right iliac fossa. This is a very important sign in the localization of the point of obstruction previous to the operation. On piano percussion small zones of flatness were outlined beneath the scar. These show the von Zeugermann-Teufel areas of shortening so characteristic of mechanic obstruction.

Diagnosis: Mechanic ileus of the obturation type; otherwise

this patient would have been dead long before this time, as it is fifteen days since the initial obstruction was noted.

OPERATION

Dr. Murphy (January 10th, 2 P. M.): After dividing the right rectus muscle and its sheaths there is noted vaulting forward of the peritoneum, and upon incision of the latter free fluid escapes, probably accounting for the flatness. The coils of small bowel are greatly distended, as was found upon physical examination before operation. The cause of this distention is, as you see, a band due to intestinal adhesions, under which passed a coil of small bowel: this coil was not completely obstructed, nor was it gangrenous; it showed, however, a deep depression from the long-continued pressure of the band. [Reëstablishes lumen of compressed portion of bowel by dissevering band; with a catgut stitch tucks in raw surface of bowel due to pressure of band; sponges and instruments accounted for and wound closed without drainage.] . . .

POSTOPERATIVE COMMENTS

This was a case of obturation ileus, thereby accounting for the fact that the patient was able to live so long, and was in complete accord with her physician's diagnosis of "incomplete obstruction." There was great hyperplasia of the small intestine above the point of obstruction, showing the long period the bowel had been under tension trying to force the intestinal contents through the point of mechanic obstruction.

The mortality of acute intestinal obstruction continues to be colossal and appalling. The able paper recently written by that master teacher and brilliant operator, Dr. John B. Deaver, in conjunction with Dr. George G. Ross (*Annals of Surgery*, February, 1915, 198), accentuates this, as it shows that there is approximately a 40 per cent. mortality for acute mechanic intestinal obstruction, including both the internal and the external type. In this calculation of 40 per cent. mortality, 56 per cent. were strangulated hernia, namely, external obstructions, so that approximately 56 per cent. at least should have been recognized

early and should therefore have a mortality of not more than 2 or 3 per cent., while the other 44 per cent., though more difficult of recognition, as a rule, have symptoms that are clean cut and pronounced, and a diagnostician of average information and experience should recognize them, and when recognized as mechanic obstructions, a man of mediocre information should insist upon an immediate operative procedure.

McGlannan's experience with massive strangulated hernia (see p. 452) shows that the mortality rate is nearly 50 per cent., as against 26 per cent. in other forms of strangulated hernia, corresponding with Deaver's.

When, in a clinic by such a master as Deaver, the mortality of intestinal obstruction still continues high, it must be admitted that the mortality is not an operative mortality, but a procrastination mortality—a mortality due to either failure or delay in making and acting upon a diagnosis. It seems to me that the profession must raise its voice to a higher pitch in condemning this practice in the future than it has in the past. There is no longer an excuse for this mortality. It has not materially improved in thirty-five years, notwithstanding the great improvement in diagnostic aids and in the technic of operative procedures —a rather sad commentary on the pace of general advancement of the medical profession.

The classification of ileus, the chronologic order of symptoms, the physical signs in the various types of dynamic, adynamic, and mechanic ileus, seem so plain that they should be comprehended and mastered by every general practitioner of medicine. The clinical story makes up four-fifths of the information; the physical findings, laboratory information, etc., make up the remaining fifth. It is, however, a bedside proposition, better, an immediate bedside proposition, where the elaborate laboratory and machine diagnostic aids cannot be made readily available. Therefore, clinical experience and analysis of clinical symptoms and signs must always constitute the greatest factors in arriving at a positive differential diagnosis.

If one could withhold the abuse of the hypodermic in these cases, I am sure that the greatest barrier to timely differential

diagnosis would be overcome. But that medical curse—the hypodermic—is so easily available and puts the patient in such comfort and ease with himself that his pathology ceases longer to cry aloud for relief, and he is lulled to a hasty euthanasia. A law that the hypodermic injection should not be given in acute abdominal lesions until the diagnosis is made is one that should be stamped on the coverlid of every hypodermic case. The public needs some instruction in this particular, as they cry out for the patient's immediate relief, rather than for a diagnosis, and then an intelligent and safe "relief" of the patient.

TABLE SHOWING ETIOLOGY OF 276 CONSECUTIVE CASES OF ACUTE INTESTINAL OBSTRUCTION ADMITTED TO THE GERMAN HOSPITAL, PHILADELPHIA, DURING THE DECADE ENDING 1913 (DEAVER AND ROSS)

Postoperative adhesions		81 cases
Post-inflammatory adhesions		16 "
Strangulated hernia		156 "
Inguinal	77	
Femoral	50	
Umbilical	21	
Ventral	7	
Subdiaphragmatic	1	
Carcinoma of sigmoid		8 "
Volvulus		5 "
Fecal impaction		3 "
Intussusception		2 "
Adynamic ileus		2 "
Congenital bands		1 case
Cause not known or not recorded		2 cases

Postscript (*March 2, 1916*).—The patient made an uneventful recovery and left hospital in usual time. She had gastric lavage every three hours following the operation, until no more fluid accumulated in the stomach: she also received proctoclysis of 1½ pints of sodium bicarbonate, 6 : 1000, every three hours. The following day she passed flatus, and the second day, feces. She was not given a cathartic at any time.

A cathartic immediately following an operation for intestinal obstruction is always a source of danger, and is not indicated. The intestine needs no additional cathartic irritation. If the

obstruction has been of long duration, a full dose of pituitrin should be administered and repeated every three hours until peristalsis is reëstablished. (For further observations upon the use of pituitrin in paralytic ileus consult article by Gibson in *Annals of Surgery* for April, 1916, 447.)

(For a talk on the varieties, symptoms, and treatment of ileus, with illustrative cases, consult vol. iii, August, 1914, 617–661.)

POSTOPERATIVE VENTRAL HERNIA (THREE CASES). STONE IN CYSTIC DUCT—CHOLECYSTOSTOMY (CASE III)

Summary: Case I.—Clinical history of patient; comments—review of surgical history; necessity of restricting use of morphin; operation—extensive adhesions encountered; imbrication-operation performed; postoperative comments—pulmonary edema as a cause of death; prevention and treatment of pulmonary edema.

Case II.—Clinical history of patient; comments—exploration of abdomen when operating for incisional hernia; the high mortality of umbilical and ventral hernia: its causes; operation—dense adhesions encountered in lower abdomen; imbrication-operation performed; postoperative comments—effect of hot oil on adhesion-formation.

Case III.—Clinical history of patient; comments—adhesion-formation in incisional hernia; importance of early operation; operation—stone in cystic duct; cholecystostomy; imbrication of flaps.

CLINICAL HISTORY OF PATIENT

A MALE, thirty-five years of age, was admitted to Mercy Hospital June 3, 1915. The family history reveals that the patient's father died from carcinoma of the stomach. The patient contracted gonorrhea thirteen years, and a chancre twelve years, previously: he received modern luetic therapy.

In 1898 the patient suffered an attack of fever, jaundice, and constipation, and was laid up in bed for one week. For many years he was constipated and had attacks of abdominal pain in the umbilical region, which often confined him to bed for two or three days at a time.

In 1911 the patient was operated upon for appendicitis: the appendix was eight inches long and was removed. For some months after the operation he felt fairly well and was able to attend to his work.

In 1912 the pain in the abdomen recurred, but was moderate in severity, though often continuing for days at a time: it was

not localized. The patient was usually more comfortable when the stomach contained food: there was occasionally food-relief.

In July, 1913, the patient was operated upon for gall-stones, but none was found: the gall-bladder was drained for two or three weeks, but without relief.

Since the second operation the abdominal pain has come on intermittently: it is not associated with chills or fever; the attacks are often so severe that morphin is required for relief. Vomiting is associated with the severer attacks alone. There is no blood in the stools.

During the last year or two the patient has been an invalid: he becomes very tired when walking or standing and has severe temporal and occipital headaches, usually in the morning upon awakening.

Romberg's sign is negative. The pupils react to light. The patellar reflexes are greatly exaggerated. The Wassermann test is negative. The urine showed hyaline casts.

The appendectomy scar is firm and does not protrude. There is an enormous protrusion at the site of the gall-bladder operation: the nerve-endings in the scar are very sensitive. Skiagram reveals elongation of the stomach to the right, with apparent contraction of the pyloric zone for a distance of three inches toward the fundus. There is no evidence of obstruction of the large intestine.

COMMENTS

Dr. Murphy (June 5, 1915): The frequency with which the anodyne was administered is not stated in the history: in the heavy expression, the drooping mouth, and the glaring eyes, his is the classic facies of the drug *habitué*.

The patient had originally some trouble in his abdomen: whether or not it was appendicitis no one can say, because one can obtain no corroborative evidence of that malady from him. The appendix was presumably removed on account of pain in the right side of the abdomen and constipation. Next the gall-bladder was operated upon, but without relief: following this operation there was an incisional hernia, seven or eight inches in

length. We shall explore the abdomen, for we haven't the slightest idea of what is causing the pain, nor are we convinced that he has *real* pain.

This is a disagreeable case, for the patient is a drug *habitué* of the doctor's making: I speak of it as a professional matter. Unfortunately, too many such cases are of our making. The primary dose of morphin is a crime wherever there is a lesion producing recurrent pain: once you start it, you cannot get away from it, and if you do not give it to the patient some one else will. A dose of morphin administered to relieve the pain of acute inflammatory trouble, if given after the diagnosis has been made, is an entirely different matter; but the morphin should never be given in such a case *until after the diagnosis has been established.* Experimental surgery has shown that morphin is a real antiphlogistic and subdues inflammatory action.

OPERATION

[The abdominal cavity was entered through the gall-bladder hernial scar: exploration revealed very extensive adhesions, but no distended coils of intestine or other evidence of obstruction to the digestive tube as a sequence of the adhesions; a small adhesion between the pylorus and the infundibulum of the gall-bladder; no evidence of ulcer at the pyloric zone of the stomach, no evidence of gastric dilatation, and no hernia at the site of the appendectomy scar. After freeing the small and large intestines about the hernial zone, the great omentum was folded upward to cover the whole regional peritoneum and sutured in the gastrohepatic fossa, so as to prevent adhesion of the stomach and intestines to the under surface of the liver, or to the parietal peritoneum, and the incision was closed by the longitudinal overlapping flap method, which resulted in great diminution of the girth of the abdomen. After closing the peritoneal cavity the field was sponged off with 5 per cent. phenol, and the skin was closed with catgut sutures. A rubber drainage-tube was inserted into the subcutaneous wound to provide for the escape of oozing of blood during the first forty-eight hours, thereby preventing hematoma-formation.]

POSTOPERATIVE COMMENTS

The postoperative mortality of cases of large incisional and massive umbilical herniæ is apt to be comparatively high, from the development of pulmonary edema. When put back to bed, the patient is usually in good condition, but difficulty in breathing appears and becomes more and more marked; a slight irritating cough develops, cyanosis begins, and then foamy material bubbles out of the mouth, becoming bloody.

In my childhood days I heard tales of the lumbermen in northern Wisconsin—of how, after riding from twelve to twenty-four hours a day with the temperature down to 30° or 40° below zero, some of these men came into the house, sat down by the stove, went to sleep, and never awoke. The cause of death in these cases was pulmonary edema from the sudden entrance into a warm room after the long exposure to cold.

The first case of pulmonary edema I saw after graduating in medicine was in a patient who had Bright's disease. After coming in from a sleigh-ride this man sat down by the stove, began to cough a little, and developed increasing difficulty in breathing. I saw him probably one hour after the onset of the symptoms: he became more and more cyanotic every few minutes, and although he was perfectly rational, yet I notified his brother that he would die very quickly, and he died two hours later.

We had been performing hernia operations of all types for twenty years before meeting with a case of pulmonary edema, and while that patient died, since then we have had three other cases, and all three recovered.

This patient will be placed in bed with the foot of the bed elevated from 8 to 15 inches. He will be given atropin,—$\frac{1}{120}$ grain every four hours,—and if pulmonary edema appears, the atropin will be pushed in doses of $\frac{1}{50}$ grain every half-hour until the physiologic limit is reached, and to the atropin, morphin and adrenalin will be added: we believe that adrenalin has had some influence in aiding the recovery of our later cases.

The only explanation which I have offered for the development of pulmonary edema is a deficiency in the action of the dia-

phragm muscle in breathing. The cause of death lies in the fact that the diaphragm does not act promptly against the increased intra-abdominal tension due to the reduction of the hernia and approximation of the wound-edges, so that respirations become shorter and shorter. Many years ago, in 1898, we showed conclusively that the diaphragm is the piston of respiration, the other muscles being accessory only, and that anything which interferes with the diaphragm interferes also with the real piston of respiration. It is exactly like the piston of an engine: it produces a minus pressure by its contraction.

Postscript.—The patient made an uneventful recovery.

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CASE II

CLINICAL HISTORY OF PATIENT

A FEMALE, thirty-three years of age, was admitted to Mercy Hospital June 15, 1915. The family and previous histories are negative.

Sixteen months previous to admission the patient underwent an abdominal operation, but she does not know what the nature of the operation was. She has felt weak since the operation. She has never been jaundiced.

Examination by Dr. Murphy (May 11, 1915).—Tenderness is elicited by perpendicular finger-percussion in the gall-bladder zone. The perineum has been well repaired. Vaginal examination reveals a small cyst in the left ovary, which is not, however, large enough to require an operation. At the site of the operative scar there is separation of the aponeurosis with a hernial protrusion, and there is extensive diastasis of the recti muscles.

COMMENTS

DR. MURPHY (June 16, 1915): In addition to the large incisional hernia, the patient states that she has the same pain which she had before the operation. In the presence of such a hernia with its inevitable adhesions, not only is a second operation unpleasant, but the picture of the average disease in the

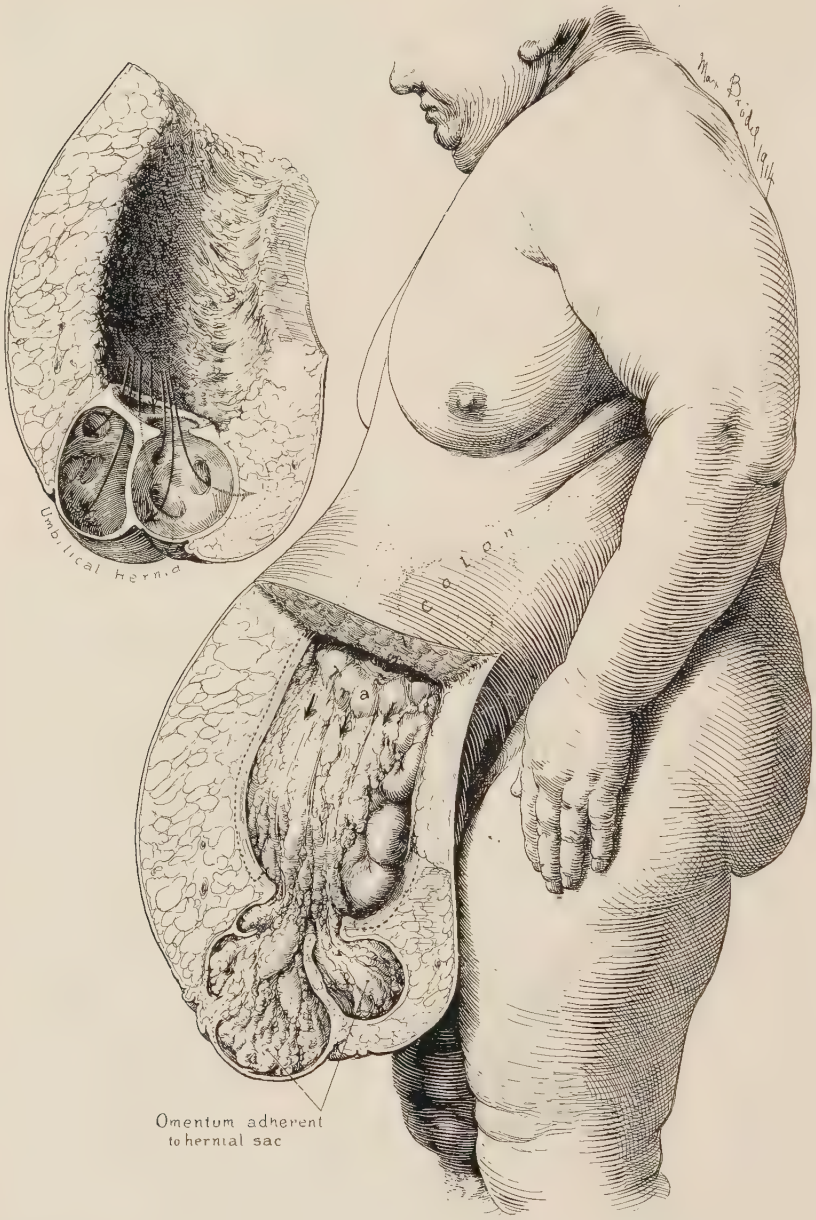

Fig. 83.—(Cullen.)

abdomen is blurred by the adhesions: nevertheless, owing to the tenderness on perpendicular finger-percussion over the gall-bladder, we are going to examine the gall-bladder and the rest of the abdomen so as to relieve her of the cause of the pain as well as of the hernia.

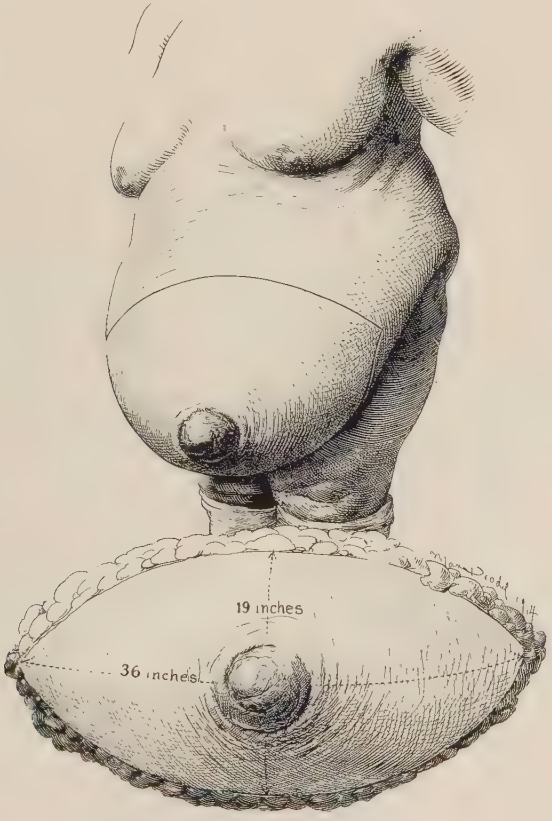

Fig. 84.—(Cullen.)

[Refers to case of hernia described above (p. 445).] Since we operated upon that patient an article upon the subject of massive umbilical and ventral hernia by McGlannan, of Baltimore, has appeared (*Surg., Gyn., and Obstet.*, June, 1915, 700–704). Comparing the mortality of these varieties with that of

inguinal hernia, McGlannan found that in a series of 1900 non-strangulated inguinal hernias there were but 4 deaths—a mortality rate of a little over 0.2 per cent.; while in a series of 197 umbilical and ventral hernias operated upon by the same group of surgeons during the same period of time, there were 6 deaths—about 3 per cent. In this latter series there were 46 massive hernias with 3 deaths—about 6 per cent.; and when strangulation complicates the condition, the mortality rate in the massive hernias reaches *nearly 50 per cent., as against 26 per cent. in all other forms*

Massive umbilical hernias usually occur in the very corpulent (Figs. 83 and 84), and in those well advanced in years. The mortality is due to lesions of the cardiovascular and renal systems (Bright's disease, myocarditis, arteriosclerosis, etc.) or to pulmonary edema (see p. 448).

After the operation this patient remained in bed for two weeks, and the wound healed by primary union, without suppuration. We do not hold the surgeon responsible for the development of this hernia, because a postoperative hernia may form despite what one does to prevent it.

OPERATION

[Exploration revealed that the gall-bladder was compressible and free from adhesions and stones; that the pyloric zone of the stomach was free from adhesions; and that dense, fibrous adhesions prevailed throughout the lower half of the abdomen, the uterus being covered by a mass of adhesions. The adhesions were freed from the anterior abdominal wall until the hernia was exposed throughout its length: at one place the large intestine entered a diverticulum in the sac. After freeing the adhesions and reducing the hernia, the omentum was interposed and fixed between the intestines and the anterior abdominal wall; the operative field was swabbed with 5 per cent. phenol, and the wound was closed by an overlapping flap operation (as in Fig. 85), figure-of-8 silkworm-gut sutures being so inserted as to include both sheaths of the recti muscles and also obliterate the dead space between the anterior sheath and the skin. The skin-

edges were approximated with horsehair. A fine drain was inserted beneath the superficial stitches, to be removed at the end of forty-eight hours.]

POSTOPERATIVE COMMENTS

I have seen this severe type of adhesions only in cases in which an attempt had been made to prevent their formation by

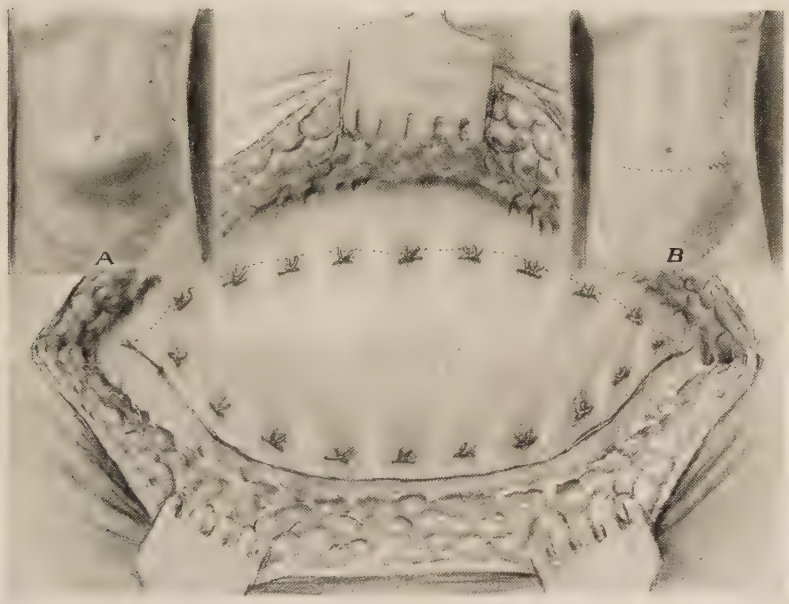

Fig. 85.—The transverse overlapping flap operation for ventral hernia. Dotted line indicates edge of lower flap.

pouring hot vaselin or paraffin into the peritoneal cavity: the densest and firmest adhesions I ever saw were the sequence of such a method of treatment.

Postscript (*March 7, 1916*).—Nine months have elapsed since the operation was performed. Examination today reveals a strong operative scar: there has been no recurrence of the hernia.

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CASE III

CLINICAL HISTORY OF PATIENT

A FEMALE, fifty-seven years of age, was admitted to Mercy Hospital September 13, 1915. The family and previous histories are negative.

Nine months ago, in December, 1914, the patient was operated upon for suppurative appendicitis: two weeks after the operation she had pain, chills and fever, and a pelvic abscess which discharged through the vagina. By the end of five days she had recovered, but noticed near the line of incision a bulging of the abdominal wall which, on coughing, protruded to about the size of a cucumber: this bulging was never present while the patient was at rest. There is no pain.

The patient has noticed an area of tenderness near the right costal margin, which has been more marked in the past year. She states that in August of each year she suffers from "bilious attacks"—no colic and no jaundice, but the skin becomes yellowish.

Examination by Dr. Murphy (September 2, 1915).—When the patient coughs, there is a marked anterior bulging of the abdominal wall, which extends above and below the line of the scar, but which is not sacculated. There is an oval mass in the gall-bladder notch of the liver: it moves synchronously with the liver, and from its oval shape feels like a gall-bladder under great tension, but palpation cannot be accurately carried out owing to the sensitiveness of the scar from the previous operation. Vaginal examination is negative.

COMMENTS

Dr. Murphy (September 15, 1915): We must anticipate adhesions in this case, first, because an abscess followed the removal of the appendix; secondly, because when incisional hernia has developed after an operation in an infected field the rule is that the intestine will be found adherent to the wall of the hernial sac.

Nearly two weeks ago we operated upon a patient in whom a large calculus had been left impacted in the ampulla of Vater

following cholecystectomy performed elsewhere (case reported in vol. iv, December, 1915, 1137–1143). We removed the stone transduodenally. A long period of suppuration had followed the previous operation of cholecystectomy, and a large number of adhesions were present: it took us nearly one-half hour to find a free area of peritoneum anywhere in the abdomen, but we hope that we shall not encounter that condition here.

The presence of this hernia is very annoying to the patient. In addition to the bulging, there is paralysis of the rectus muscle on the inner side of the line of incision: the bulging itself extends higher than is usual after an operation for the removal of the appendix.

It is now only nine months since the original operation was performed—not a very long time. Given an incisional hernia, the shorter the period of time that has elapsed since the operation was performed, the less liable the patient is to suffer ill-effects from the operative reduction of the hernial contents into the abdominal cavity, with the consequent increase of intra-abdominal pressure.

OPERATION

[On opening the abdomen it was found that the bowel was not adherent to the anterior abdominal wall, but to the margin of the hernial sac, from which it was freed; the gall-bladder was enlarged, and a stone was impacted in the cystic duct; the stone was displaced from the cystic duct into the gall-bladder, and cholecystostomy was performed in the usual manner. After accounting for sponges and instruments the wound was closed by the imbrication-flap method. A wound-splint was applied to prevent transverse cutting and necrosis of the skin from the pressure of the silkworm-gut.]

Postscript (October 5, 1915).—It is now three weeks since the operation was performed: the wound healed by primary union, and the stitches were removed today. The drainage-tube was removed on the tenth day.

(For further comments upon postoperative ventral hernia, together with illustrated description of operative technic, consult vol. iii, August, 1914, 861–869.)

CARCINOMATOSIS OF PERITONEUM—EXPLORATORY OPERATION

Summary: Clinical history of patient; comments—differential diagnosis; operation—exploratory; postoperative comments—clinical course of the disease; cystadenomata *vs.* papillomata of peritoneum.

CLINICAL HISTORY OF PATIENT

A FEMALE, forty-five years of age, was admitted to Mercy Hospital February 21, 1916. The family and past histories are negative. Menstruation began when the patient was thirteen years of age, has always been regular, occurred every twenty-eight days, lasted from three to four days, and required one or two napkins a day: the latest period occurred one week ago. The July menstruation was accompanied by abdominal pain; the October menstruation was accompanied by abdominal pain and repeated vomiting; the January menstruation began while the patient was in bed with pleurisy, and lasted six days—two days longer than usual—and was accompanied by soreness in the lower abdomen, but there was no fever; the February menstruation was ten days late and lasted only three days.

On July 17, 1915,—seven months previous to admission,—the patient was attacked by severe pain in the right and left iliac regions, which did not radiate. Fever, nausea, vomiting, and tenderness were absent. The duration of the attack was one-half of an hour.

On July 20th a similar attack occurred and lasted the same length of time.

On October 1st the bowels became markedly constipated and were moved with great difficulty.

On November 26th dull pain began in the lower portion of the abdomen and at times radiated down the lower limbs. The pain lasted for the greater part of the day, and required a dose of

morphin for relief. After each meal the patient was nauseated and vomited. She was tender over the lower portion of the abdomen—especially in the right iliac region. There was no fever.

Since November—now three months—pain and vomiting have occurred daily. The bowels have become more regular: they have contained neither blood nor mucus. There is no discomfort after eating. The patient has slowly lost in weight. The urine is negative. The heart-sounds are normal.

Examination by Dr. Murphy (February 21, 1916).—Bimanual palpation reveals a mass extending for three inches above the symphysis pubis, and situated more to the left of the midline. Occupying the pelvis—especially the right side—there is a hard tumor, which has pushed the uterus far down into the vagina, until its fundus rests just beneath the symphysis. This tumor has the resistance of a fibroid and cannot readily be displaced from the pelvis: the uterus is freely movable upon it, and the mass should be interpreted as an ovarian fibroid or a thick-walled ovarian cyst.

COMMENTS

Dr. Murphy (February 23, 1916): During the past three days we have operated upon three cases of ectopic gestation, and while that condition might come into mind, yet in this case the history is different; the uterus appears to be lifted out of the pelvis, and the latter contains a hard, resistant tumor. It is a question whether or not this pelvic tumor is associated with an impregnated uterus. The clinical history is not a clean-cut one of a fibroid of the uterus—unless it should be an extramural fibroid, which gives a peculiar clinical history.

The patient is forty-five years of age. Excepting the menstrual symptoms, this patient's history corresponds to that of ovarian fibroid: a dermoid tumor, too, could give rise to a similar history, but typical dermoid tumors of the pelvis do not impart such a wood-like feel, and, moreover, they are small. During the bimanual examination I was unable to displace the tumor from the pelvis: it seemed to be wedged in that cavity. The cervix rested anteriorly and was so soft that it suggested im-

Fig. 86.—Carcinomatosis of peritoneum disseminating probably from rupture of adenocarcinomatous ovarian cyst.

pregnation of the uterus. There were free fluid in the peritoneal cavity and some irregular nodules, extending over to the left of the larger tumor mass, but connected with it.

OPERATION

[Upon opening the abdomen free fluid was found in the peritoneal cavity: the peritoneum itself was somewhat edematous, and an indurated mass the size of a ten-cent piece was excised from the parietal peritoneum; upon opening the peritoneal cavity more widely both parietal and visceral peritoneum were found studded with thousands of similar masses (Fig. 86), which resembled the miliary implants of a ruptured cystadenoma. A mass was found filling the pelvis: it was wood-like in hardness, round, smooth, and possibly an ovarian fibroma. On the left side of this a conglomerate massing of these neoplasms and tumors prevented palpation or inspection of the ovaries. An immediate microscopic examination was made, which showed it to be adenocarcinoma, probably from the rupture of an adenocarcinomatous ovarian cyst. The condition being inoperable, the sponges and instruments were accounted for, and then the incision was closed without drainage.]

POSTOPERATIVE COMMENTS

These cystadenomata are primarily semimalignant in character, but eventually become malignant: like malignant disease of the peritoneum, they tend to disseminate, not through the circulatory channels, but on the surface; eventually they spread over the entire peritoneum, the ascitic fluid increases in quantity, and finally the patient becomes enormously distended and dies from the effects of the parasitic tumors. In thus terminating life the disease behaves like malignant disease, but differs from the latter by metastasizing upon the surface alone.

Cystadenomata come and go very much like warts, and occasionally they are cured by therapeutic doses of *x*-rays and arsenic, as in the case of a patient from Indiana upon whom we operated six years ago, and who is now living and well.

These cystadenomata are closely related to papillomata of the peritoneum, and are implants of epithelial cells.

The prognosis in this case is not necessarily fatal, unless upon examination the specimen should prove to be carcinoma.

Pathologic Diagnosis.—Carcinoma of the peritoneal lymph-nodes. This was confirmed by hardened sections. Invasion and mitoses are present in all portions of the section.

Postscript.—The wound healed *per primam.* The patient will be treated by therapeutic doses of *x*-rays, sodium cacodylate, and Coley's serum.

The tumor continued to enlarge, notwithstanding the enormous doses of *x*-rays, administered through the Coolidge tube, and the colossal doses of sodium cacodylate given. She left hospital in seven weeks.

(A case of carcinomatosis of the peritoneum emanating from a carcinoma of the colon as a primary focus is reported in vol. iv, April, 1915, 277–87—illustration on p. 283.)

TUBERCULOUS PERITONITIS, ENTERITIS, LYMPHADENITIS—EXPLORATORY CELIOTOMY

Summary: Clinical history of patient; comments—construction of diagnosis; operation—tuberculous peritonitis, enteritis, and lymphadenitis—celiotomy with closure; postoperative comments—the pathology and curability of tuberculous enteritis and peritonitis.

CLINICAL HISTORY OF PATIENT

A FEMALE, thirty-eight years of age, was admitted to Mercy Hospital November 21, 1915. The family history is negative. During the past fifteen years the patient has suffered from "bronchitis." She was operated upon eight years ago for "tumor of the stomach"; one year ago for "appendicitis"; and eight months ago a third abdominal operation was performed, the nature of which she does not know (*vide infra*). She has not menstruated for the past two months.

Since the abdominal operation was performed eight months ago, shortly after the patient has ingested any variety of food cramps appear in the abdomen and left side of back, and there is a desire to defecate: after defecation the pain disappears for a time. In frequency the bowel-movements have averaged from ten to fifteen a day: they contain much undigested food. On certain days—especially when the patient is fasting—the bowels move but once. Every time the bowels move the urine "leaks": the latter contains "white strings."

During the past three months, when the abdominal cramps occur there is a "twisting" pain in the left foot at night: the foot still hurts when the patient walks very much.

The appetite is poor. The only discomfort after eating is due to the cramps. The patient eructates much gas, but there is

neither nausea nor vomiting. She feels weak. Within the past eighteen months she has lost 39 pounds in weight: her present weight is 96 pounds.

Fever is associated with the severe abdominal cramps. Recently the patient has had night-sweats and a very slight cough, but no expectoration: there has also been some dyspnea.

Examination by Dr. Murphy (November 10, 1915).—Vaginal palpation reveals no infiltration in either fornix, nor any evidence of metastatic deposit in Douglas's pouch. The cervix is normal.

On bimanual examination there is found above the symphysis a sensitive mass which apparently involves the fundus of the uterus. Felt through the abdomen, the mass is hard and wood-like, but when felt through the vagina, no such ligneous sensation is imparted. The mass feels like the site of a short-circuiting intestinal anastomosis: it seems to be adherent to the uterus.

The feces did not reveal blood upon examination. The urine showed two or three white cells in each $\frac{1}{6}$ objective microscope-field. Examination of the blood revealed 80 per cent. of hemoglobin and a leukocytosis of 11,800.

COMMENTS

Dr. Murphy (November 23, 1915): Word was received from the hospital where the patient was operated upon in March, 1915, that a mass about the size of a goose's egg was found in the midst of the small intestines, which were adherent to each other, as well as to the anterior abdominal wall: whether the mass was of inflammatory or neoplastic origin was not determined. Since it was not considered advisable to dissever the adhesions or attempt to remove the mass, lateral anastomosis was performed between the small intestine proximal to the mass and the upper portion of the sigmoid (ileosigmoidostomy): the abdomen was closed without drainage.

The history of chronic cough, weakness, night-sweats, loss of appetite and of weight suggests pulmonary tuberculosis; while the abdominal cramps, frequent bowel-movements with undigested food-particles, and rectal tenesmus, when taken in conjunction with the finding of a conglomerate mass of intestines

at the time of the operation, which was performed elsewhere, suggest intestinal tuberculosis.

The patient is suffering from pain and discomfort. On palpation the mass seems still to be about the size of a goose's egg: the question is whether or not it can be removed. The tuberculin test was positive.

OPERATION

[Exploratory celiotomy revealed multiple foci of tuberculosis involving and agglutinating coils of small intestine, in which ulcers could be palpated and recognized without difficulty. The retroperitoneal lymph-nodes were involved and greatly enlarged. Resection of bowel and ablation of tuberculomata being out of question, after accounting for sponges and instruments, the wound was closed without drainage.]

POSTOPERATIVE COMMENTS

In tuberculosis of the intestines we have to deal with a lesion which, until modern times, was considered incurable. Previous to the use of tuberculin, no cure of a tuberculous ulcer of the intestines had ever been recorded. When Koch's tuberculin came into use Paul Goodman, of Berlin, presented four specimens of healed tuberculous ulceration of the intestine to the Virchow Pathologic Institute: Virchow said of them that they were the first examples of completely healed intestinal tuberculosis which he had ever seen.

Tuberculous peritonitis treated by tuberculin heals more rapidly than tuberculosis of any other tissue in the body, for it comes under the classification of pure tuberculous infections, and tuberculosis *per se* rarely terminates fatally.

Tuberculous enteritis, on the contrary, occurs in a field in which mixed infection is constantly present: the tissues are unable to cope alone with the combined destructive effects of the tuberculous and non-tuberculous infections, and, like lupus, heal in one place while breaking down in another. Without tuberculin these tuberculous nodules do not heal at all: they destroy

life by diarrhea, exhaustion, and by producing stenosis of the gut from cicatricial repair of the transversely spreading ulcers.

There is another interesting feature about the tuberculous intestinal nodule: it destroys the mucous membrane by spreading in an upward instead of a downward direction: reinfection does not occur, as a rule, from arrest of tubercle bacilli on their way downward, but from the tubercle bacilli which are conveyed upward by the proximally coursing lymph-stream, to lodge in the solitary submucous lymph-nodes at intervals of from 1½ to 2 inches. We observed this proximally directed advance of the infection very early in our intestinal work. I recall a patient from Ohio who, for fifteen years, had complained of recurrent intestinal cramps and diarrhea, and ultimately of intestinal obstruction, which was practically complete. Physical examination revealed an induration in the abdomen, the nature of which was by no means obvious. Exploratory celiotomy revealed tuberculosis of the ileum, the oldest lesion being the one with the greatest amount of cicatricial tissue: from this oldest lesion the younger ones had spread in an upward direction for a distance of 5 feet, with gradually decreasing degrees of cicatricial density. The entire zone was resected and the patient made a complete recovery. This patient, too, has a good chance of recovering completely: she will be treated by therapeutic doses of *x*-rays and tuberculin.

Postscript (*January 1, 1916*).—The stitches were removed on December 7, 1915, two weeks after operation. Tuberculin and *x*-ray treatments were begun one week later, on December 14th. By December 21st the wound was entirely healed with the exception of a very small area, and there was practically no discharge. The patient left hospital shortly afterward.

(For further information on this subject consult Dr. Murphy's article on "Tuberculosis of the Alimentary Canal and Peritoneum," which appeared in the *Illinois Medical Journal* for March, 1912.)

FECAL FISTULA—CLOSURE BY ENTERORRHAPHY (TWO CASES)

Summary: Case I.—Clinical history of patient; comments—review of events leading up to fistula; reduction *en masse;* importance of resecting bowel wide of gangrenous area; operation—abstract of findings and manner of dealing with them.

Case II.—Clinical history of patient; comments—review of development of fistula; rarity of rupture of appendiceal abscess into urinary tract; the seed-test for intestinal fistula; plan of operation for fecal fistula; avoidance of injury to ureter; operation—exposure and closure of fistula.

CLINICAL HISTORY OF PATIENT

A MALE, thirty-six years of age, was admitted to Mercy Hospital September 21, 1915. The family and past histories are negative.

In 1909, 1910, and 1911 the patient had three severe attacks of dull pain in epigastrium. The pain bore no relation to meals and lasted three or four hours: during and after the pain the patient was nauseated, but did not vomit. There was no fever, nor were there any chills.

On February 16, 1911, the appendix was removed: following the operation a stitch-abscess developed, but healed within one week. There was no further pain in the stomach.

On February 26th—ten days after operation—there appeared fever, chills, and pain in the right arm and chest, which localized in the region of the liver. Gaseous distention of stomach and nausea were present, continued for from five to six hours after each meal, and were relieved by vomiting. The bowels were open. Examination of the blood revealed leukocytosis.

On March 14th—sixteen days later—a subhepatic abscess was found at operation and evacuated, and tubal drainage was established: the wound discharged for four weeks and then

healed. After this second operation the patient was restored to good health.

In January, 1912, after a sudden exertion, the patient felt sharp pain in the lower right quadrant of the abdomen, and noticed two bulgings—one on the right at the site of the appendicitis celiotomy-scar, and the second on the left, in the inguinal region. Although an abdominal support had been worn, yet the celiotomy-hernia gradually increased in size.

On August 3, 1915,—nearly four years after the appearance of the herniæ and seven weeks previous to admission,—the right-sided celiotomy-hernia and the left-sided inguinal hernia were operated upon at one sitting in his home town: no pus was found during the operations. For four days after the operation there was obstruction of the bowels: fever was present, but chills were absent.

On August 7th—four days after operation—the fourth and last operation previous to admission was performed. The abdomen was opened through the linea alba, below the navel: a segment of bowel was gangrenous and bathed in pus; three inches of small intestine were resected, and an end-to-end button-anastomosis was performed; drainage was inserted, and pus and feces were discharged. During the next two days fever and chills were present, and at the end of the second day the median incision gave way and a profuse discharge escaped: left inguinal lymphadenitis appeared. Later both hernial postoperative incisions gave way, discharged purulent material profusely for four weeks, and then healed.

At present there is a fecal fistula in the midline. There has been no bowel-movement through the rectum since August 8th—the day after the last operation.

COMMENTS

Dr. Murphy (September 28, 1915): The feces are all escaping through the midline fistula: there is no discharge of feces from the right or the left hernial postoperative incision.

The first two days following the hernial operations were uneventful; on the third day the patient complained of abdominal

discomfort from distention; on the fourth day he was enormously distended and began to vomit; some angulation must have been produced from reduction of the right-sided postoperative hernia *en masse*. Those who are familiar with the literature of hernia know that there may be adhesions at the neck of the hernial sac, and that if these are not recognized and dissevered at the time of operation, strangulation of the bowel is liable to occur from this "reduction *en masse*." Such was the sequence in this case—one of these adhesions produced a mechanical obstruction, with dilatation and later gangrene of the bowel from distention.

The untoward course following the operation of resection of the bowel on August 7th—the suppuration and the development of fecal fistula—was due to the fact that the resection was performed too close to the gangrenous area of bowel, and a button was used in the presence of pus and feces in the peritoneal cavity. Many years ago I called attention to the importance of going wide of the gangrenous bowel when performing resection for intestinal obstruction, in order to insure the approximation of *healthy* bowel-ends: if this union is made too close to the gangrenous area, the patient will die from leakage-peritonitis within from seventy-two to ninety-six hours.

There is no operation in the entire realm of surgery which I dread so much as the one which we have before us this morning, because the intestines are adherent clear down into the pelvis, and the fecal matter from the fistula must be kept out of the field (Figs. 87–91).

Injection of methylene-blue through the rectum escaped through the fistula, showing that it is not far from the sigmoid flexure.

OPERATION

[After exposure of the abdominal contents it was found that from ulceration a large opening about three inches in length existed in the caput coli, and that the small intestines were involved in numerous adhesions, with a transverse communication between two coils on the left side, at the site of the button-anastomosis, the button resting upon one of the coils. With difficulty the intestine was freed from adhesions to the anterior

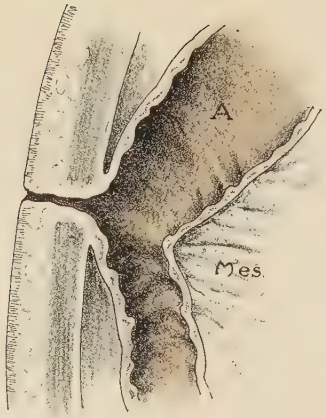


Fig. 87

Fig. 88

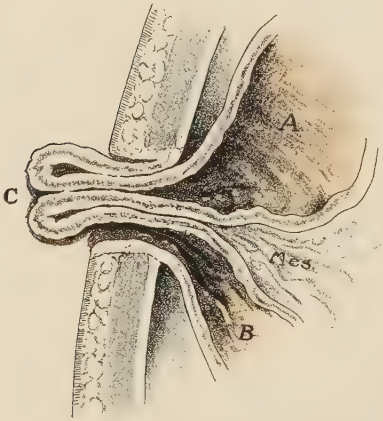


Fig. 89

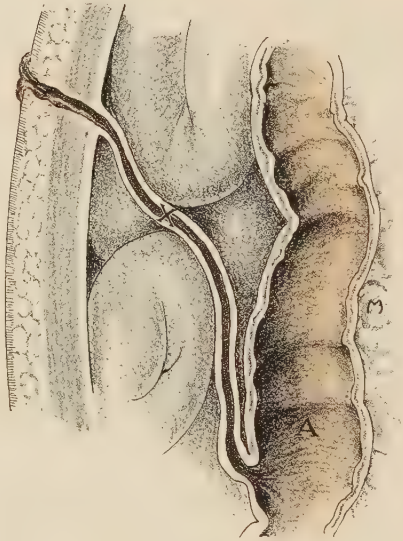


Fig. 90

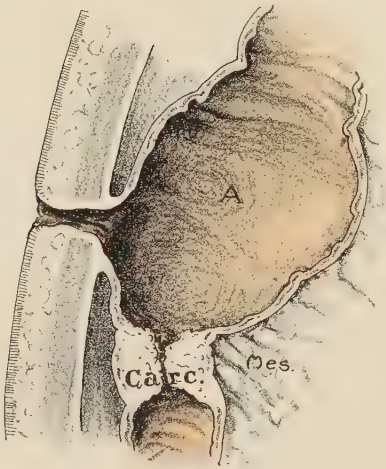


Fig. 91

Figs. 87–91.—Types of fecal fistulæ: Fig. 87: Simplest form. Fig. 88: Spur formation, or reducible-hernia type. Fig. 89: Artificial anus, or irreducible hernia. Fig. 90: Fistula leading to intestine remote from abdominal wall (the type in which Beck states that injections of bismuth paste "will be of great service"). Fig. 91: Fistula leading to intestine above cancer. (Modified from Coffey.)

abdominal wall, the button was removed, and, using a Czerny-Lembert suture of chromic catgut, an anastomosis was made at the site of the second fistula. The opening in the cecum was closed, and the ileum was brought over and stitched laterally to give support to the line of union, whereupon the approximation appeared to be very secure. Drainage was established by means of rubber tubes; sponges and instruments were accounted for, and the wound was closed under great tension by figure-of-8 through-and-through sutures. An intravenous infusion of a liter of normal saline solution was given on the table. A rectal tube was inserted to prevent accumulation of gas in the large bowel. The operation consumed three hours, but the patient left the table in fairly good condition. The head of the bed was elevated immediately after the operation, and ¼ grain of morphin was administered.]

Postscript (*October 29, 1915*).—The patient is still in hospital, and his condition is very satisfactory.

Ten days following the operation there was a pus discharge from the mid-wound, and five days later feces appeared. He had been having, however, frequent bowel movements *per rectum*. He was then given some *x*-ray treatments and the fecal fistula closed. Four weeks later another point of suppuration appeared, and again there was a fecal leakage, which finally closed completely.

February 25, 1916.—The patient left hospital January 13, 1916. The sinus has opened up and closed again a number of times since he left.

CASE II

CLINICAL HISTORY OF PATIENT

A MALE, thirty years of age, physician, was admitted to Mercy Hospital December 10, 1915. The family history is negative. When three years of age the patient suffered an attack of diphtheria, which was followed by paraplegia and strabismus.

Four years previously, in November, 1911, the patient was operated upon for appendicitis. Fever came on five days after the operation, but soon subsided. Ten days after operation the

temperature rose to 102° F., and there was a severe chill. There was no pain in the side, nausea, or vomiting.

About the twelfth day after operation the patient noticed that, when standing on his feet, the right thigh was flexed at the hip and that he could not extend it fully: there was also a "lump" in the right side, about the size of an orange.

In January, 1912,—two months after the first operation,—the second operation was performed: the wound was reopened and a drainage-tube was inserted. During the night after the operation "something broke," and the next morning the dressings were found saturated with pus. The wound continued to discharge until September.

On September 1, 1912, the third operation was performed: a fistulous tract was followed to the right renal region, and a stab-wound for drainage was made in the right lumbar region, above the iliac crest. After the operation the sinuses in front healed promptly, but the sinus in the back continued to discharge yellow, purulent material.

One month after the operation the patient was attacked by a severe cramp in the abdomen, and the wound began to discharge dark-brown material with fecal odor: the pain lasted about one hour and was not severe enough to require morphin-relief. These attacks recurred at intervals of from four to six weeks until June, 1914: in the intervals between the attacks of pain yellow pus was discharged.

In June, 1914, the fourth operation was performed: the lumbar fistula was dilated, and a drainage-tube was inserted; at the same time large doses of autogenous vaccine were administered. The tube was gradually shortened, and the fistula closed in the fall of 1914. The patient did not wear a dressing for two months.

In October, 1914,—four months after the fourth operation,—after the patient had taken a short motor ride, the wound partly reopened and began to discharge, but healed after being incised and drained.

In January, 1915, after unusual muscular exertion, profuse hematuria appeared, and the next day the wound again partly

reopened: after incision and drainage of the wound the hematuria rapidly subsided, and the discharge stopped and did not recur for four weeks.

In February, 1915, the hematuria reappeared, but stopped after incision of the abscess, which had formed at the site of the wound. Urinalysis at that time showed albumin, casts, renal and vesical epithelial cells, and blood-cells coming from both kidneys. This renal condition was promptly cleared up by the administration of urotropin with the patient in bed and upon selected diet. The severe cramps were relieved, and the patient gained in weight.

On February 22, 1915, the patient passed fig-seeds and a husk of popcorn through the sinus (fistula): at times he had noticed suspicious particles in the discharge, but this was the first evidence that the sinus communicated with the bowel, *i. e.*, that there was a fecal fistula.

Examination revealed no fixation of the spine, nor any evidence of psoas abscess.

COMMENTS

Dr. Murphy (December 13, 1915): Primary union followed the operation for appendicitis, but twelve days later fever appeared, and the patient noticed a lump in his right side, and the thigh was flexed, indicating that the psoas muscle was tense. The infection was well back of the caput coli, in the zone of the psoas muscle: there then followed a course of recurrent opening and discharge. The probabilities are that the abscess ruptured into the urinary tract.

These are rare lesions: in the early articles we wrote upon appendicitis rupture of an appendiceal abscess into the urinary tract was mentioned as one of the complications, but I have not seen such a rupture since fifteen or eighteen years.

At some place this sinus communicates with the lumen of the bowel, forming a fistula, because within the last few weeks the patient passed seeds through the tract. Seeds are the best and simplest means of determining such a communication: just feed the patient some strawberry jam for five or six days, when finally

some of the seeds will begin to pass through the fistula, as nothing else will.

Owing to the recurrent attacks of inflammation of the peritoneum we must expect to encounter matting of the intestines to the abdominal wall and to each other.

The diagnosis of fecal fistula having been established, the plan of operation requires, first, entering the peritoneal cavity above or below the site of the fistula; secondly, freeing the bowel at the site of the fistula from the abdominal wall, excising the fistula, and finally closing the perforation by making an entropion of its edge into the lumen of the bowel (Fig. 92). If these steps are not successfully executed, recurrence follows recurrence, as in this patient. The average time for this operation is two and one-fourth hours, and sometimes three hours are consumed, as in the previous case.

A most serious accident which we fear in this case is that of encountering and removing a portion of the ureter before recognizing it, because the anatomic lines of demarcation will be practically all obliterated from infiltration, and one does not recognize the tissues until after he has opened them, or even until they are out on the table.

OPERATION

[After opening the peritoneal cavity the zone of fixation of bowel at site of fistula to anterior abdominal wall was exposed, first from below and on the inner side, and then from above and on the outer side, until the fingers contacted when passed around the zone of fixation; after controlling the fecal current by clamps the fistulous opening in the intestine was detached from that in the abdominal wall; the caput coli was elevated and mobilized by cutting the posterior parietal peritoneum to its outer side; the intestinal end of the fistula was a minute orifice in the cecum, at the site of the stump of the appendix: it was closed by three tiers of chromicized catgut sutures; after accounting for sponges and instruments the wound was closed under tension by figure-of-8 through-and-through sutures, allowing room for the passage of tubal drainage. There was also posterior tubal drainage through the posterior sinus tract.]

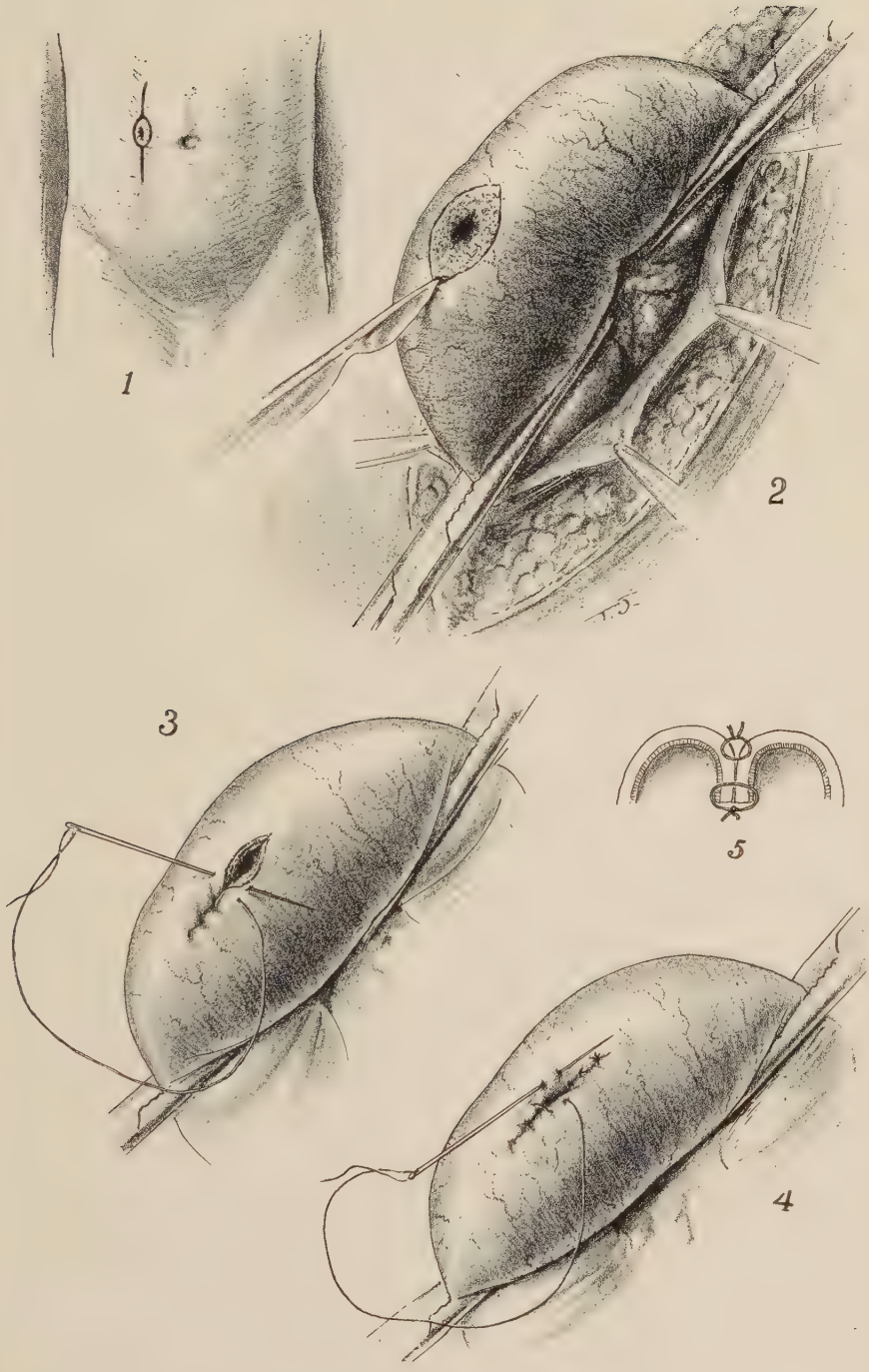


Fig. 92.—Steps in closure of fecal fistula (see text).

POSTOPERATIVE COMMENTS

Rushton Parker, of Liverpool (*Med. Press and Circ.*, March 22, 1916, 257), makes some interesting comments upon fecal fistula:

"One somewhat different case was that of a youth admitted into hospital having a dozen or more abdominal fistulæ. The case was one of typhoid, mild, no doubt, but said to have been treated at home, walking about, and fed on meat and potatoes! Some of the fistulæ were discharging feces, others pus, and all were judged to be perforations of small intestine. The patient was now fed chiefly on beef-tea, and the affected skin was covered with waterproof tissue, daily cleansed, and reapplied under a draw-sheet. The sinuses discharging pus soon discharged only serum, those discharging feces gradually discharged only pus, and eventually serum, followed in every case by drying up. The patient completely recovered, and never seemed to have been seriously ill at any stage of his malady.

"This is the principle on which I have always treated the few fecal fistulæ of the abdomen that occurred now and then after operation and reduction of strangulated hernia. One such case, in a woman, discharged through a stitch-hole after umbilical herniotomy. Nothing was done beyond reducing the diet as above described, and washing away the fecal discharge at the changes of dressing. In this and every case that I can remember the fistula dried up and got well."

Reporting good results in the treatment of fecal fistulæ with injections of bismuth paste, Beck (*Surg., Gyn. and Obstet.*, May, 1916, 510) states: "It is a fortunate circumstance that precisely in those cases where operations are very difficult or impossible the paste is of excellent service, while in those cases favorable for operation the paste is of comparatively little value. . . . It is customary with us, when a fecal fistula follows an operation, to wait at least two weeks for spontaneous closure. By this time, if the fistula has not entirely closed, it is usually narrowed down to small caliber and then the injections of paste (of thick consistency, so that it will not run into the bowel, but will fill out the usually

wide channel and prevent the escape of fecal matter) are instituted at intervals of one or two days." (See Fig. 90, p. 468.)

Postscript (*January 4, 1916*).—Following the operation there was no discharge, and the tubes were removed. The wound healed *per primam*. The patient was discharged today.

March 25, 1916.—The patient reports that he has gained 20 pounds, and expects to resume practice this month.

(For a comprehensive discussion of the subject of fecal fistula see vol. iv, February, 1915, pp. 1 to 38; see also article by Coffey in *Annals of Surgery* for June, 1907, and Guthrie, on "The Prevention of Fecal Fistula in Suppurative Appendicitis," *ibid.*, April, 1916, 452.)

POLYPOSIS OF SIGMOID—ENTEROTOMY—ABLATION

Summary: Clinical history of patient; comments—analysis of history; characteristics of hemorrhage in tuberculosis; operation—enterotomy with ablation of polypi; postoperative comments—etiology of intestinal polypi; the germicidal action of lysol on colon bacilli.

CLINICAL HISTORY OF PATIENT

A MALE, thirty-six years of age, was admitted to Mercy Hospital February 18, 1916. The family history reveals that one of the patient's grandmothers died from carcinoma of the uterus, and that one sister is suffering from carcinoma of the stomach. The past history is negative.

Ten years ago, after taking a large dose of a laxative, the patient noticed blood in stools.

From 1907 to 1912 the patient occasionally passed blood in stools: there was pain at times, and the bowels became more and more constipated.

In 1913 small amounts of blood were passed intermittently.

On February 3, 1916,—fifteen days before admission,—after driving to town in a buggy, the patient had a severe hemorrhage from the bowel, which was controlled by packing the rectum. There had been two copious bowel-movements on the morning of the day of the hemorrhage.

On the day of admission the patient's bowels were very loose, owing to his having taken castor oil the day before: there was also a painless discharge of bright red blood.

The patient feels fairly well, but has lost some weight. The course of the malady has been afebrile throughout. The patient has had no cough nor night-sweats. His appetite is good. There have been no gastric disturbances.

Proctoscopic examination with a 14-inch tube revealed dark

blood throughout, but no ulceration. A clot of blood was obtained from the stomach by lavage on the day of admission. The tuberculin test was absolutely negative. Palpation revealed no tumor in any position in the abdomen, nor any evidence of increased peristalsis. The bismuth meal was negative.

COMMENTS

DR. MURPHY (February 19, 1916): At no time did the patient complain of food-discomfort. There are no symptoms or signs pointing toward disease in the upper abdomen. The history extends over a long period of time, and the malady is characterized by an afebrile course throughout. In tuberculosis—whether of lung or intestine—the rule is that a hemorrhage is preceded by fever and the patient feels sick. In tuberculous hemorrhage from the urinary tract no fever precedes the attack, since mixed infection is absent in that tract.

In our analysis we are unable to determine the source of the hemorrhage. Intestinal bleeding, which has continued for such a long period of time, is usually due to tuberculosis or polypus, of which the former gives rise to more profuse bleeding. I recall one patient with tuberculous enteritis who had bled intermittently for ten years: I saw him fifteen years after the onset of the symptoms, and at operation resected five feet of small intestine.

OPERATION

[Exploratory celiotomy revealed no evidence of disease in the upper abdomen, the small intestine, the ileocecal region, the ascending or the transverse colon; when the sigmoid loop was reached, however, palpation (Fig. 93) revealed several soft tumors which slipped around in the lumen of the bowel, between the palpating fingers. Enterotomy was performed through the anterior tenia coli, and on separating the cut edges of bowel, the polypi were exposed to view (Fig. 94). Each polypus was successively removed after transfixion and ligation of its base with catgut. Each incision into the bowel was accurately closed by Czerny-Lembert sutures, making an entropion of the cut edges,

and each line of intestinal suturing was reinforced by stitching over it an epiploic tag. After accounting for sponges and instruments, the operative field was swabbed with lysol to destroy colon bacilli, and the celiotomy-wound was closed in the usual manner without drainage. A permanent rectal tube was fixed to relieve the sigmoid from gas tension.]

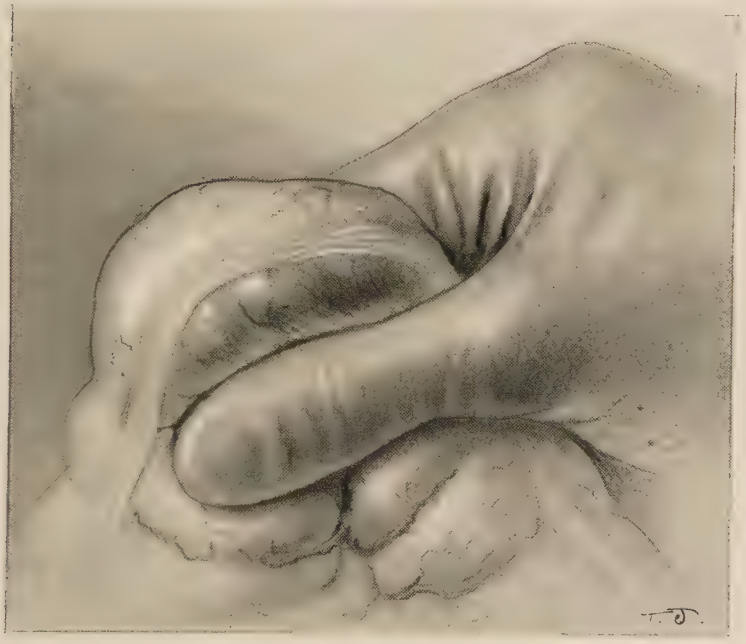


Fig. 93.—The palpating fingers detect slippery tumor-masses within the lumen of the sigmoid.

POSTOPERATIVE COMMENTS

The etiology of intestinal polypi—like that of the common wart—is shrouded in mystery: whence they come, why they go, is like the riddle of the Sphinx. The apparently causeless and symptomless "essential" hemorrhage from the bowel, and the absence of constitutional disturbances despite the chronicity of the lesion, both suggest the diagnosis, and are in complete accord with the pathologic findings at operation.

The colon bacilli, liberated by enterotomy, show a predilection for infecting fatty tissue—both the subperitoneal and the subcutaneous—rather than the peritoneum, the resisting powers of which are greater. We swabbed the operative field with lysol, in preference to the customary 5 per cent. phenol, because lysol exerts a stronger germicidal action upon the colon bacillus.

Fig. 94.—Polypi exposed after incising sigmoid through anterior tenia coli.

The patient's diet will be restricted to soup alone. We inserted a rectal tube in order to prevent the accumulation and retention of gas, which, if not allowed to escape freely, would subject the enterotomy wounds to a dangerous degree of tension.

Reporting a case from the Mayo Clinic and reviewing the literature, Carroll (*Surg., Gyn. and Obstet.*, April, 1915, 412–414) states: "Intestinal polyposis is a comparatively rare disease. . . . Polypoid growths may occur at any point along the gastro-intestinal tract, but in the majority of cases they are found

in the large intestine, usually at its turning-points, and in the rectum. . . . Intestinal polypi may be single or multiple, the latter being more common. . . . Doering cites 24 cases of rectal polyposis in which carcinoma was present in 15. . . . The growths often cause obstruction and intussusception. . . . The symptoms usually vary with the position, size, and number of the polypi: hemorrhage, diarrhea, and vague abdominal symptoms, as colic and obstruction. . . . The diagnosis can be made only when the polypus is seen or felt. . . . Of 52 cases reviewed by Doering, only one patient was perfectly well after four years. In many cases the involvement may be so extensive as to preclude even surgical interference."

Postscript (*March 7, 1916*).—It is now seventeen days since the operation was performed: the stitches have been removed, and the patient is now permitted to sit up. There has been no more bleeding from the bowels.

Pathologic examination revealed polypi ranging in diameter from 1 to 2.5 cm. The microscope showed adenoma, with suspicious areas of active cellular proliferation.

PERIRECTAL SINUS—EXCISION

Summary: Clinical history of patient; examination; operation—excision of sinus; postoperative comments—discussion of congenital pararectal tumors and sinuses—the neurenteric canal.

CLINICAL HISTORY OF PATIENT

A FEMALE, twenty-eight years of age, was admitted to Mercy Hospital January 15, 1916. The family history is negative. Nine years ago, two weeks after an attack of puerperal sepsis, the patient had "neurasthenia"; there were severe pains in the spine, and a fever of 104° F. She did not recover for one year. Menstruation is regular but scanty, and is accompanied by severe pain in right side of pelvis and right thigh. There has been profuse vaginal discharge since the birth of her child, nine years ago.

In November, 1913, during a menstrual period, the patient suffered from severe, sharp pain low in the pelvis, and radiating along the rectum to the back; there were a chill and fever, and later a "perineal" abscess developed. After being incised, the abscess continued discharging for six months, and eventually the coccyx was resected; two more operations were performed, but the discharge has never abated for more than one week.

Of late there has been daily afternoon fever, but neither coughing nor night-sweating. The patient is often hoarse in the evening and continually during damp weather.

Examination by Dr. Murphy (January 20, 1916).—Bimanual pelvic examination reveals that the uterus is anteflexed, and although it cannot be moved from side to side, yet there is not enough infiltration in the fornices to account for the symptoms: neither tube is thickened, and Douglas's culdesac is clear. To the right of the rectum and behind it there is a limited area of infiltration. A sinus leads from behind the rectum down toward

the lower margin of the tuberosity of the ischium, but no juxtaposition of the sinus with the stump of the coccyx is demonstrable. Cystoscopic and proctoscopic examinations were negative. The tuberculin test was also negative. Diagnosis: Retrorectal dermoid (Fig. 95).

OPERATION

[With the finger in the rectum as a guide, after an extensive dissection the sinus was followed behind the rectum to its termination: while it was close to the rectum, yet it did not communicate with the latter at any point, nor with the coccyx, and the rectum was not opened into during the operation. A large amount of cicatricial tissue from the previous operations was encountered. In order to obliterate the space left remaining after excision of the sinus the rectum was stitched snugly against the tissues behind it. A tube was inserted for drainage.]

Fig. 95.—Retrorectal dermoid.

POSTOPERATIVE COMMENTS

In dissections in this region the nerves controlling the sphincter ani muscles are jeopardized, and the wound left remaining is extremely slow to heal. The stitches will not be removed for two weeks; and during that time, in order to counteract intra-abdominal pressure upon the rectum, the patient must lie flat on the abdomen in bed, notwithstanding the difficulty of emptying bladder and bowel while in that position.

Owing to the proximity of the sinus to the rectum there is always the danger of infection of contiguous tissues occurring; and an abscess behind the rectum should suggest, first of all, an infected retrorectal dermoid, because of the frequency of the

latter tumor in this situation. An abscess resulting from an infected retrorectal dermoid may open into the rectum and discharge itself into it, leading to the mistaken diagnosis of ordinary abscess: if merely opened and drained, however, such a dermoid abscess will continue discharging until the epithelial lining of the cyst has been wholly ablated.

Retrorectal dermoids may reach the size of a walnut and even that of a child's head; they may extend anteriorly, pushing the rectum before them; and often upward into the abdomen, simulating an intrinsic abdominal tumor: if one should attempt to remove such a tumor through a celiotomy-incision under the mistaken diagnosis of pelvic cyst, he would get into a peck of trouble. I recall a case of this type in a girl who came from Cleveland: the uterus and adnexæ were shoved so far forward by the dermoid tumor that the uterus rested above the level of the pubes (Fig. 96). In removing these tumors the posterior route is the one of choice.

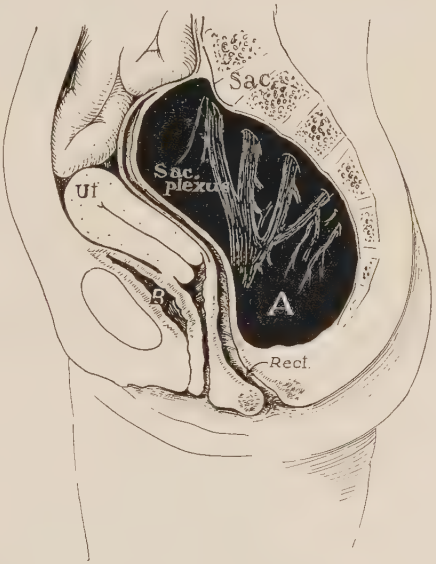


Fig. 96.—Colossal retrorectal dermoid.

There appears early in the human embryo a fissure at the head-end of the primitive streak. Soon converted into a canal, it opens into the vitelline sac. It is termed the *neurenteric canal* (Figs. 97 and 98) and is merely a temporary structure, its remains being represented in the adult by the sacral dimple. Occasionally remnants of this epithelium-lined canal persist and give rise to a pilonidal cyst, a subsacral mucous cyst, or a retrorectal dermoid.

Pilonidal cyst (Fig. 99) is illustrated in the case of a patient

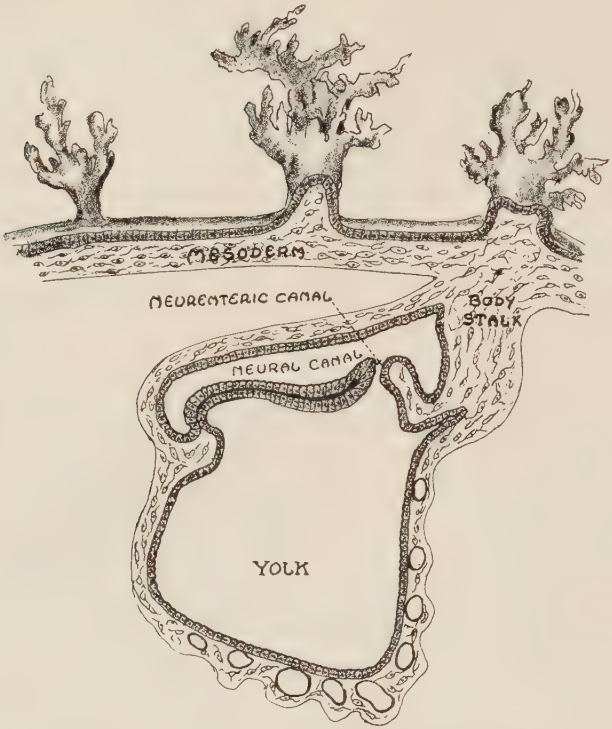


Fig. 97. Orientation of neurenteric canal (Hertwig).

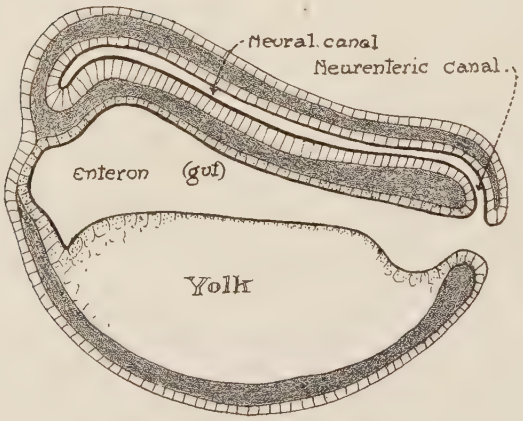


Fig. 98.—The neurenteric canal as a passageway between the neural tube and the hindgut (Hertwig).

who complained of "a discharging fistula at the end of the spine" of several months' duration. Examination revealed a dimple in

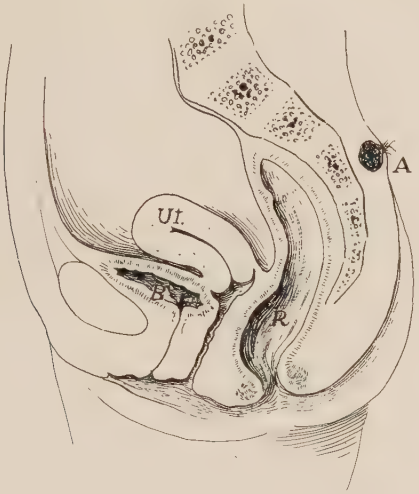


Fig. 99.—Pilonidal cyst.

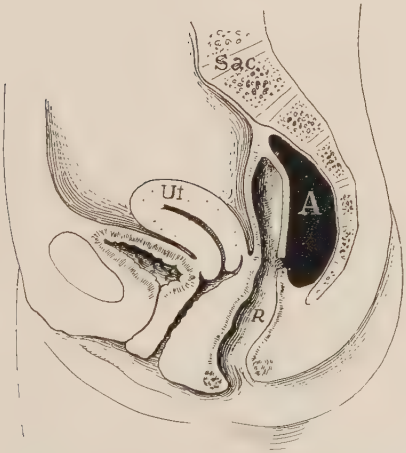


Fig. 100.—Subsacral mucosa-lined cyst.

the midline, near the upper end of the anal groove, which led into a sinus: this conveyed a probe upward and slightly forward for

three inches, and the removal of the probe brought away several dark, long hairs. The treatment is radical extirpation. In the differential diagnosis it must be distinguished from a sinus leading from a focus of tuberculous osteomyelitis, and possibly from a fistula-in-ano.

A subsacral mucous cyst represents the retention of a deeper portion of the neurenteric canal: it is found behind the rectum and is lined by columnar cells resembling those of the latter (Fig. 100).

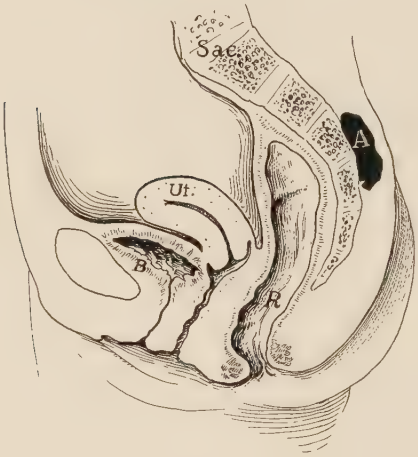


Fig. 101.—Retrosacral dermoid.

In reference to tumors in this region C. H. Mayo (*Surg., Gynec., and Obstet.*, January, 1916, pp. 11–17) writes: "Dermoid tumors, sacrococcygeal in type, are very common, and are caused by the rapid growth of the spinal column producing traction on the neural canal, which originally reached to the skin of this region. Here also are found the teratomata from the coccygeal body. These tumors contain mucous membrane from the post-anal bowel, nerve-tissue from the neural tube, bone and cartilage from the coccyx, and various inclusions of surrounding tissue. Some of them have mucous cysts lined with ciliated epithelium from the neural tube, showing the misplacement of tissue to have occurred before the third month of gestation."

(A case entitled "Postsacral Dermoid" (Fig. 101) was published in vol. ii, August, 1913, 647–649.)

Postscript (*February 25, 1916*).—The postoperative granulating sinus is practically entirely healed.

CARCINOMA OF RECTUM (TWO CASES)—CASE I—KRASKE ABLATION; CASE II—STAGE I: COLOSTOMY; STAGE II: KRASKE ABLATION

Summary: Case I.—Clinical history of patient; comments—one- *vs.* two-stage operations; first operation—iliac sigmoidostomy; second operation—Kraske ablation; third operation—application of Dupuytren's clamp; postoperative comments—importance of early recognition of cancer and early operation; mortality statistics of cancer of rectum; selection of cases for operation.

Case II.—Clinical history of patient; comments—charlatan bests ethical practitioner in recognition of cancer of rectum; procrastination in cases of cancer fatal; first operation—steps of Kraske ablation; second operation—for prolapse of rectum.

CLINICAL HISTORY OF PATIENT

A MALE, thirty-five years of age, was admitted to Mercy Hospital October 22, 1915. The family history revealed that the patient's father died at the age of thirty from tuberculosis of the "stomach," and that a maternal grandaunt died from carcinoma of the breast. Twelve years previously the patient suffered for one year from hemorrhoids. Seven years previously he had an attack of typhoid fever.

In December, 1913,—nearly two years ago,—the patient noticed for the first time increased frequency in the desire to defecate: he went to stool ten or twelve times a day, and experienced difficulty in the act, as though the feces were blocked in their downward passage; at times there was no passage at all, but merely rectal tenesmus. The stools were flattened.

This state of affairs gradually became worse, and the stools flatter and flatter and streaked with both mucus and blood, but mucus was never passed without feces. Since four months there has never been a bowel-movement unassisted by cathartics, which the patient must take daily. There is no true pain with the bowel-movements, but merely a sense of discomfort.

Since one year there has been weight- and dragging-discomfort throughout the lower abdomen: this is becoming worse. The patient has lost 25 pounds in weight. He feels weak. He has had no chills, fever, or headache.

COMMENTS

Dr. Murphy (October 23, 1915): Proctoscopic examination reveals a malignant neoplasm on the posterior wall of the rectum, beginning three inches above the anus: how far upward it extends could not be determined, owing to the stricture that is present.

The desirable method of treatment is radical removal of the neoplasm at one sitting, but this would expose the patient to too much hazard from feces streaming over the operative field, giving rise to suppuration and sepsis. I propose, therefore, to perform a two-stage operation, in the first stage establishing an artificial anus, and in the second ablating the neoplasm by the Kraske method, if there are no metastases within the abdomen contraindicating an operation. We shall try to preserve the integrity of the sphincter ani muscles by securing end-to-end union. In accomplishing the first stage the chances of infection are diminished.

A reëstablishment of the lumen of the intestines as a continuous tube for the feces may be accomplished by the application of Dupuytren's clamp, without performing laparotomy.

FIRST OPERATION

[Through a left McBurney-McArthur incision an unopened segment of sigmoid flexure was brought up and stitched to the margins of the celiotomy wound, according to technic described in vol. v, February, 1916, 42—illustration on p. 40.]

SECOND OPERATION

[On December 10, 1915, the rectal neoplasm was ablated by the usual Kraske method. Comparatively little blood was lost, but an intravenous infusion of saline solution was administered before the patient left the operating-room. The lower tube was

removed on December 21st, when union was firm. Rectal injections of a 1 : 2000 solution of the hypochlorite of calcium were administered.]

THIRD OPERATION

[On January 12, 1916, complete primary union of the Kraske field of operation was found, and there was no evidence of return of the disease. The Dupuytren clamp was applied to the colostomy spur, according to the technic illustrated in vol. v, February, 1916, p. 41, Fig. 8.]

POSTOPERATIVE COMMENTS

It is greatly to be regretted that a patient should be allowed by his medical attendant to suffer from carcinoma of the rectum for two years before coming to the operating-table: to relieve these sufferers *early* radical operation should be performed, instead of failing to examine the patients and giving them suppositories. Like many cases of cancer of the uterus, all cases of carcinoma of the rectum are received by the surgeon in the superlatively advanced stage of the disease. The rectum is one of the very favorable fields for the removal of carcinoma, as is true of the remainder of the large intestine (see vol. v, February, 1916, 15).

The immediate mortality for radical ablation of cancer of the rectum has been diminished to about 20 per cent., and when performed by this two-stage method (Figs. 67, 68, 69, 70, 71, pp. 374–6), I think that it has been further diminished to 16 per cent., while the combined laparotomy and Kraske operation, according to Schloeffer, in 36 cases had a mortality of from 54 to 60 per cent. (Heller). In a collection of 343 cases by 33 authors the average mortality was 28.8 per cent., being 36 per cent. in males and 15 per cent. in females. Of 134 cases that survived the operation, 31 lived over the three-year period. This, if taken to represent the probable recurrences from the total number, is a little over 9 per cent.—not a very flattering showing, and decidedly against the combined one-sitting operation from an immediate mortality standpoint. In an article upon the direct operative treatment of

cancer of the rectum Hartmann (*Journal de Chirurgie*, 1913, xi, 2, pp. 692–702) reviews the subject from the historic, statistical, and bibliographic aspects. Of 1665 cases operated upon by the perineal or sacral route, 264 died from the effects of the operation—an immediate mortality of 15.8 per cent.; while of these 1665 cases, 825 were followed up, and recurrences were found in 561, or 68 per cent., so that of these patients operated upon by the perineal or sacral route, 84 per cent. succumbed to operation or to recurrence. Hartmann advocates the combined abdominoperineal method of extirpation, and of 260 cases operated upon by this method, there was an immediate operative mortality of 98, or 37 per cent., and an ultimate mortality of 18 per cent. from recurrence, the combined mortality being 55 per cent. Hartmann presents the following conclusions:

"In spite of its considerable immediate gravity, the operation elaborated for cancer of the rectum by the abdominoperineal route seems to me to be an operation of the future because, from the standpoint of recurrences, it is incontestably superior to all methods previously practised. A larger percentage of immediate cures will be obtained by avoiding the mistakes which we have previously made, by practising systematically terminal colostomy, and by judiciously selecting the cases.

"In the future we shall reject the operation in patients over sixty years of age, in the obese, and in those who have bad kidneys; on the other hand, we shall not limit the abdominoperineal operation to cases of rectosigmoidal cancer alone, but shall extend it to neoplasms situated lower down; and since cancers of the rectum are accompanied by adenopathies situated high up, they can be definitely cured only by an operation by the combined route—a method which alone permits heed to be taken of the general rule in dealing with cancer, that *radical operation means ablation of the tumor, together with the lymphatic territory which is secondarily invaded by it.*"

It appears from these statements that the removal of the adenopathies made a great addition to the permanent cure. This does not coincide with our analysis of the postmortem findings in a large number of cancers of the large intestine, including

the rectum; 36.6 per cent. of 90 cases had no demonstrable metastases in the lymph-nodes or in distant organs on the necropsy table. It does not, therefore, seem justifiable that the additional hazard of the combined operation should be taken, because of the percentage of lymph-node involvements possibly present at the time of operation.

Postscript.—The patient left hospital early in February. When last seen on February 18, 1916, his condition was excellent.

CASE II

CLINICAL HISTORY OF PATIENT

A MALE, fifty years of age, was admitted to Mercy Hospital May 19, 1914. The family history is negative. Thirteen years ago the patient had an attack of syncope, and fifteen minutes later vomited about one quart of dark-red blood: this was the only attack of hematemesis. There is no history of epigastric pain or indigestion.

Ten months previous to admission,—in July, 1913,—after a difficult bowel-movement, the patient noticed in the stool a clot of dark blood the size of two fists: there was no pain in the abdomen or rectum during this passage. After this, dark blood, varying in amount from a streak to a teaspoonful, has been present in every stool.

In September, 1913, the patient again passed a clot of blood similar in color and size to the first clot: after passing it he felt very weak. There has never been passage of mucus or blood independent of feces.

Since September every stool has contained mucus and bright-red blood, varying in amount from a teaspoonful to half a cup; and there has been constant, dull aching in the rectum, which is relieved only by lying down.

Since December, 1913, the patient has lost about 20 pounds in weight. His appetite remains good.

Examination reveals a malignant neoplasm on the anterior wall of the rectum, just above the anus.

COMMENTS

Dr. Murphy (May 21, 1914): This patient's history is somewhat interesting. He had been treated for a long time by his family physician for hemorrhoids; not noticing any improvement, he consulted a charlatan, who said: "Sir, you are suffering from cancer of the rectum, and you must consult a surgeon in reference to undergoing an operation." This episode may be uncomplimentary to the ethical members of the profession, but nevertheless it is true. Even though he was a quack, the charlatan had had enough experience and had made a *sufficiently careful examination* to recognize the gravity of the patient's lesion, and very sensibly refused to assume responsibility for the case.

Procrastination in cancer patients is both unfortunate and unnecessary: all that it accomplishes is the dissemination of cancer-cells throughout the body, until it is impossible, by delayed operation, to save the patient's life. Even when cancer is right out in the open, as in the case, for example, of cancer of the lip, the physician and the patient's friends look at the lesion month after month before insisting upon operation (*vide* vol. iv, August, 1915, 600).

OPERATION

[The rectum, together with the anus, was removed by Kraske's method. As a guide to the position of the urethra during the operation a No. 26 French catheter was passed. After removal of the coccyx and lowest segment of the sacrum the rectum was exposed and freed from its attachments, the hemorrhoidal vessels being ligated *en bloc* with the regional connective tissue. After opening the peritoneum the rectum was brought down until it remained without employing traction. The rectum was clamped with a double angiotribe and divided accurately. A puckering suture was passed through the rectum one inch above the site of amputation, and a rectal tube was inserted to conduct the feces to the surface during the stages of repair. Another tube was inserted into the cavity which was left remaining after removal of the anus. The operative field was swabbed with 5 per cent.

phenol, and the space was closed with figure-of-8 silkworm-gut sutures. The catheter was removed. The perineum was reconstructed by a double row of figure-of-8 sutures. The ligated mass of tissue around the rectum was employed to elevate the stump of the rectum and retain it in a position flush with the level of the surrounding skin, thus establishing a sacral anus and preventing postoperative traction during the union of the rectum and skin.]

[*N. B.*—On November 2, 1915, the patient was operated upon for prolapse of the rectum. There was no evidence of return of the disease, and the portion of the prolapsed rectum was resected.]

Postscript.—Convalescence was rapid.

(For comments by Dr. Coffey on this subject *vide supra*, p. 373.)

(A case of carcinoma of the rectum was published in vol. iii, August, 1914, 775–81; one involving the splenic flexure appeared in vol. i, August, 1912, 581–9, and a second, close by that site and with secondary carcinomatosis of the peritoneum, appeared in vol. iv, April, 1915, 277–87.)

At the meeting of the American Surgical Association now being held at Washington, D. C., Dr. William J. Mayo reports that his mortality after excision of the rectum for cancer has now been reduced to 8 per cent.

UTERINE FIBROIDS (THREE CASES)—SUPRAVAGINAL HYSTERECTOMY. CURETTAGE (CASE III)

Summary: Case I.—Clinical history of patient; comments—analysis of history; malignant degeneration of fibroids; operation—suprapubic supravaginal hysterectomy by the posterior method.

Case II.—Clinical history of patient; comments—variations from type in clinical course of fibroids; emetin as a deodorant of offensive vaginal discharge; operation—similar to that in Case I; postoperative comments.

Case III.—Clinical history of patient; comments—analysis of history; operation—dilatation and curettage; removal of submucous polypus; postoperative comments—senile vaginitis.

CLINICAL HISTORY OF PATIENT

THE patient, forty-nine years of age, was admitted to Mercy Hospital February 17, 1916. The family history is negative. Menstruation began at thirteen years of age, is of the twenty-four-day type, lasts for three days, and required four napkins a day up until five years ago: since then each mensis has lasted one week and has required one dozen napkins a day. The patient has two children: there have been five miscarriages, but no abortions.

In September, 1910, while working in the garden, the patient became so weak that she was compelled to go into the house and lie down: while entering the house she had a sudden flow of blood from the vagina, and bled profusely until the hemorrhage was checked by a physician, who arrived an hour and a half later and packed the vagina. The patient was then removed to a hospital. The next morning the uterus was curetted.

On May 17, 1911, owing to the presence of the thyrotoxicotic syndrome, strumectomy was performed.

The latest menstrual period began on February 3, 1916, and lasted six days, terminating on February 9th. Two days later, having returned from a long walk, the patient noticed leukorrhea:

this lasted for two days, until February 13th, when a chill developed, and the patient felt faint and went to bed. Metrorrhagia began gradually and was profuse the next two days: on the third day large clots were passed, and thereafter the flow decreased in amount.

Upon closer questioning the patient made a statement which showed that an opportunity for infection of the uterus had arisen about four weeks ago, and that she was very ill after the chill developed on the thirteenth.

On admission to hospital there is still some bleeding from the uterus: the temperature is 98.6° F., and the pulse is normal.

Bimanual pelvic examination reveals a mass of wood-like hardness which is continuous with the uterus and extends clear up to the level of the navel, projecting more upon the left than the right side. There is no infiltration in the vaginal fornix on the right side.

COMMENTS

Dr. Murphy (February 19, 1916): The sudden, profuse hemorrhage which occurred in September, 1910, suggests miscarriage rather than fibroid, for the latter does not cause hemorrhage between menstrual periods, which is severe enough to require packing. After removal of the retained secundines by curettage no additional hemorrhage from that cause occurred.

The offensive leukorrhea, followed two days later by a chill, signified the onset of pelvic infection. The dragging of the uterus to the left is very suggestive of adhesions following infection of the left side of the pelvis: if adhesions are present, the removal of the fibroid uterus will be a much more difficult problem.

The fact that the patient has menstruated regularly up to her present age of forty-nine years, when taken in conjunction with the increased amount of flow at each period, gives rise to 65 per cent. of chances that a fibroid is present (*vide* vol. iv, April, 1915, 299).

Since it is a connective-tissue tumor, a fibroid is liable to undergo sarcomatous degeneration, but never carcinomatous: when carcinoma is associated with a fibroid, it will be found to

involve the uterine mucosa, and not the fibroid itself. As the result of an examination of the specimens of uterine fibroid in the London museums Bland-Sutton found carcinoma of the mucosa associated with these tumors in 4 per cent. (see vol. i, February, 1912, 87–88). I, myself, have seen but one such case.

OPERATION

[Exposure of the pelvic viscera through a celiotomy-incision revealed adhesions extending from the left adnexæ to the uterus, dragging it to the left side, and showed fresh pus, as indicated by the friable adhesions. The uterus was for the most part directly in front of the fibroid, which therefore was situated chiefly in its posterior wall, extending down into Douglas's *culdesac*. On dissevering the adhesions there was revealed a left-sided pyosalpinx, from which pus was flowing out. The right ovary and tube were free from adhesions, and the left ovary was not diseased.

Including both tubes, the uterus bearing the fibroid was removed by the usual supravaginal method (for full description of steps of this posterior operation, together with illustrations of steps of technic, consult vol. ii, April, 1913, 181–195). Both ovaries were allowed to remain. Owing to evidence of the tubal infection being recent, a drain was inserted on the left side, behind the broad ligament. After accounting for sponges and instruments the celiotomy wound was closed with the exception of a foramen through which the drainage made its way.]

(*N. B.*—For a full discussion of pelvic infections consult vol. i, December, 1912, 810–824.)

Postscript (*March 9, 1916*).—It is now nineteen days since the operation was performed: the patient has experienced no further discomfort. There was no discharge of pus through the drainage-tube, which was removed on the tenth day. Convalescence was uneventful.

CASE II

CLINICAL HISTORY OF PATIENT

THE patient, fifty-one years of age, was admitted to Mercy Hospital February 17, 1916. The family history reveals that the

patient's mother died from cancer of the stomach. The past history reveals that the patient has enjoyed good health up to the time of the present malady. Menstruation began at fifteen years of age, is regular, of the twenty-eight-day type, lasts from three to five days, and requires one or two napkins a day.

Since two years menorrhagia has occurred at intervals of from two to three months, with the exception of from August, 1915, to February 9, 1916, during which time it did not make its appearance: it returned on the latter date, however, and has been present since.

The patient has been married twenty-six years and has borne two children: there is no history of puerperal infection.

One year ago there appeared dull pain in the right iliac region. Since then the pain has been present most of the time, but is never severe and does not radiate: there is tenderness to pressure in that region.

Fever, nausea, and vomiting have been absent. The bowels have been regular, and bladder symptoms have been absent. The abdomen has not become enlarged. There is marked offensive leukorrhea. The patient has lost no weight. The urine is negative.

Bimanual pelvic examination reveals a tumor on the left side of the uterus, which measures 2½ inches in diameter. Inspection shows mucus coming from the cervix, but no blood.

COMMENTS

Dr. Murphy (February 19, 1916): Here is a patient who continued menstruating up to the age of fifty, meaning that there are 65 per cent. of chances that she has a fibroid: if she has, there is an anomaly in her history in that she stopped flowing for six months and then suddenly flowed more than before—quite rare with a fibroid—just as rare as the bleeding in the interim in the last case. The rule with fibroid is that patients flow more and more, but once they stop, the flow does not return. This anomaly makes the case suspicious, especially when taken in conjunction with the fact that the patient's mother died from cancer.

Palpation reveals a large mass in the pelvis: if it is cancer, I should say that it involves the fundus, rather than the cervix,

of the uterus. The odor of the leukorrhea did not mean anything to me, for even were cancer present, the odor would indicate merely a saprophytic infection of the neoplasm, and would continue until checked by operation or death of the patient. Recently we have succeeded in deodorizing many such cases by hypodermic injections of one-half-grain doses of emetin: we know that as a class amebæ are destroyed by emetin, and here the saprophytes which produce the odor are destroyed by the same drug.

Compared with carcinoma of the cervix, cancer of the fundus occurs about once in 100 cases.

OPERATION

[The uterus was removed according to the technic referred to in the preceding case. Examination of the specimen revealed an intramural fibroid in the posterior wall, and not far from the mucosa: there were also submucous fibroids. One small zone in the mucosa was depressed and suggested beginning carcinoma.]

POSTOPERATIVE COMMENTS

[The influence of fibroid and of cancer of the uterus upon menstruation has been discussed in vol. iv, April, 1915, 299; submucous polypi are discussed below; the morbidity of uterine cancer and the mortality statistics of operation were presented in vol. iv, October, 1915, 916.]*

Postscript (March 9, 1916).—It is now nineteen days since the operation was performed: the patient has been permitted to sit up, and in a few days will be able to leave hospital.

Pathologic Diagnosis.—"Fibrosis of the uterus and adenoma of the mucosa, with strong suspicion of beginning carcinoma."

CASE III

CLINICAL HISTORY OF PATIENT

THE patient, forty-eight years of age, was admitted to Mercy Hospital September 16, 1915. The family and past histories are

* J. B. Deaver (unpublished paper) reviews the cases of fibroid uteri upon which he has operated at the German Hospital, Philadelphia, from 1905–1915 inclusive. Among the 750 cases there were 13 deaths (1.73 per cent.), while the last 100 of these passed off without a single fatality.

In 513 cases with complete pathologic reports carcinoma was found eight times.

negative. Menstruation began at twelve years of age, is regular, of the twenty-eight-day type, lasts three or four days, and requires seven or eight napkins a day. The patient has borne eight children. The next menstrual period after childbirth usually followed within five or six months. Menstruation has been irregular for the past ten years.

After the birth of the last child,—ten years ago,—the patient did not menstruate for one year, and since then the intervals between the periods have lasted from one to twelve and even fourteen months: with each period the flow was profuse, and occasionally the patient had cramps, accompanied by backache.

In April, 1914, the flow lasted one week, was profuse, and accompanied by pains in the region of the gall-bladder and lower abdomen. There was no further flow until five weeks ago, when the patient had an attack of vertigo and pains in the lower abdomen, which were followed by metrorrhagia beginning during sleep: this flow has continued up to the present time, is increased by the slightest exertion, and at times forms large clots; during this time there have been occasional pains in the legs upon the slightest exertion.

COMMENTS

Dr. Murphy (September 18, 1915): Preceding the flow the patient had severe pains in the lower abdomen, which were expulsive in character, and the flow has persisted ever since: such a history does not suggest carcinoma, even though the family physician stated that he found carcinoma upon microscopic examination of a specimen obtained from the uterus; it suggests an intra-uterine fibroid or polypus, with expulsion pains.

OPERATION

[After dilating the cervix and examining it, no depression or excavation resembling carcinoma was found, and the curette could detach no tissue from the cervix. From the fundus there was curetted away a strangulated and gangrenous submucous polypus.]

POSTOPERATIVE COMMENTS

In this case the history coincided with the pathologic findings to a nicety, as the pain was due to the expulsion efforts of the uterus, which finally strangulated the intra-uterine polypus. A portion of this was evidently removed by the family physician and sent to a microscopist, who reported carcinoma, and complete hysterectomy was advised. The reason we took exception to this was because the clinical history of the case did not correspond with that of carcinoma.

Senile Vaginitis.—Occasionally an old lady comes to you with the story of not having menstruated for ten, fifteen, or twenty years, when suddenly a flow appears, which, while not in excess of a normal menstrual period, yet is of longer duration: as a rule, the patient says, "Doctor, I had a pain, which was a little like a labor pain." As soon as you hear such a history you know that the trouble is not cancer, but that it is probably a polypus. When the old lady comes to you with her hands trembling from paralysis agitans and tells you that she is having her "second childhood," and that there is a show of blood, do not make a diagnosis of carcinoma, notwithstanding the fact that you have heard me say that a flow at this age above the normal amount not preceded by pain is carcinoma in 100 per cent. Such a flow, however, is never equal to that of a normal menstrual period, and this show or "second childhood," as she calls it, is due to senile vaginitis instead of cancer: on the other hand, a flow occurring one, two, or five years after the climacteric, which is equal to or in excess of that of a menstrual period, is due to cancer on that evidence alone in 100 per cent.

Postscript.—The patient made an uneventful recovery, and continued well, without discharge of any kind, until March 30th (last report).

(Cases of uterine fibroid have been previously published as follows: vol. i, February, 1912, 80–90; vol. iii, August, 1914, 653–661, and 761–767; vol. iv, April, 1915, 297–303.)

EXTRA-UTERINE PREGNANCY (FOUR CASES) —SALPINGECTOMY

Summary: Case I.—Clinical history of patient; comments—analysis of menstrua history; examination; diagnosis from history; operation—left salpingectomy.

Case II.—Clinical history of patient; comments—rapid two-hour rise of leukocytes; physical examination at variance with history; operation—left salpingectomy; postoperative comments—negative physical examination accounted for by operative findings, with which, however, clinical history is in complete accord.

Case III.—Clinical history of patient; comments—dialogue with intern *in re* analysis of history; significance of a decidua; varieties of ectopic gestation (analytic table); operation—right salpingectomy; postoperative comment—appendicitis as an etiologic factor.

Case IV.—Clinical history of patient; comments—uterine *vs.* extra-uterine pregnancy; history typical for latter; operation—left salpingectomy; postoperative comments—operative method of checking acute hemorrhage by *coup-de-maitre.*

CLINICAL HISTORY OF PATIENT

THE patient, thirty-three years of age, was admitted to Mercy Hospital November 3, 1915. The family history is negative. Eight years ago the patient was operated upon for appendicitis and lacerated perineum. She has been married fourteen years and has *one child eleven years of age:* there have been no miscarriages. Menstruation began at thirteen years of age, is regular, of the twenty-eight-day type, and lasts three or four days. The flow is not profuse, and there is no dysmenorrhea.

On August 1, 1915, a menstrual period began and proved to be normal in amount and of the usual duration.

In September—five weeks after the preceding menstrual period—the patient menstruated again: while this was apparently a normal menstrual period, yet it was delayed.

In October the patient did not menstruate in the regular way, but a slight show appeared on the fourth and continued until November 1st.

On November 1st the patient menstruated profusely and had a severe pain.

COMMENTS

Dr. Murphy (November 4, 1915): I shall review the essential features of this patient's history. She was admitted last night. She is thirty-three years of age: her last and only child was born eleven years ago; she has had no miscarriages nor any pelvic infection, unless the attack of appendicitis for which she was operated upon eight years previously may be considered as such. Her last normal menstrual period began August 1st. She menstruated in September, but this period was five weeks after her previous menstrual period had begun, and was prolonged, though otherwise normal.

Since the menstrual period in September the patient has felt a discomfort in her left side, which she did not have before: occasionally this discomfort amounted to a crampy pain.

On November 1st—four days ago—she began to have sudden severe pain in the pelvis.

In considering the probability of ectopic gestation the menstrual history is the all-important factor.

Examination—which must always be conducted very gently under these circumstances—reveals slight enlargement of the uterus, but not enough enlargement to correspond with an eight weeks' uterine pregnancy. There is a bloody discharge from the cervix. On the left side of the uterus there is a soft, pulpy mass which presses down into the vagina. Examination of the blood reveals a leukocytosis of 8400, which is against the presence of an acute inflammatory condition.

In the remoteness of the last labor, the change in menstruation, the cramp-like pains, and the mild explosion as the tube stretched, the history of ectopic gestation is unfolded. There was not a severe explosion.

When I saw the patient this morning I told her to rest up until we got through with our clinic, and that we would then bring her down for examination.

When the patient was operated upon eight years ago for removal of the appendix the round ligaments were shortened: no pelvic infection was found at that time.

OPERATION

[While making the celiotomy incision it was noted that the peritoneum was discolored, showing that there was free blood in the abdominal cavity. When the peritoneum was divided, there was a large outpouring of blood, much of it clotted. The round ligaments were found plicated and holding the uterus forward. The left tube was found enlarged, ruptured, and bleeding, and was removed: the fetus had escaped. The stump was inverted, lest adhesions should form. After accounting for sponges and instruments the celiotomy wound was closed without drainage.]

POSTOPERATIVE COMMENT

In this case it was not the physical findings, but the menstrual history that made the diagnosis.

Postscript.—The patient made an uneventful recovery and was discharged from hospital at the usual time.

CASE II

CLINICAL HISTORY OF PATIENT

THE patient, thirty-six years of age, was admitted to Mercy Hospital February 14, 1916. The family and past histories are negative. Menstruation began at thirteen years of age, is regular, occurs every four or five weeks, lasts two or three days, and requires one or two napkins a day. She has been married fifteen years. Seven weeks after being severely injured in a railroad accident she gave birth to a stillborn child: this was a forceps delivery, and although the perineum was badly lacerated, yet there is no history of infection following the parturition. The laceration was repaired later.

The last normal menstrual period began December 25, 1915: the flow lasted but one day, and the quantity was less than usual, requiring only one napkin.

On January 10, 1916, the next mensis appeared fifteen days ahead of time: there was just a slight flow,—a sort of brownish discharge,—and this flow continued until February 7th, between which time and the tenth there was no discharge at all. On Jan-

uary 20th there was quite a profuse discharge, but only one napkin was used.

On January 15th—five days after the appearance of the prematurely early menstrual period—the patient was suddenly attacked by sharp pain in the hypogastrium, which radiated down the posterior portion of the left lower limb: there were also a chill, which lasted half an hour, and fever of 100° F. She was tender to pressure over this area. She had a frequent desire to urinate, but could not. She did not receive a hypodermic for the pain.

On February 7th—one week previous to admission—a similar attack occurred.

This morning (February 14th), at 11 A. M., a third attack occurred: it was so severe that it doubled the patient up. There was no fever. She was brought to hospital about 3.30 P. M. and prepared for immediate operation. The leukocyte count at that hour was 15,800.

Examination on February 10th—four days previous to operation—showed that the uterus was freely movable and displaced somewhat to the left side, but not retroverted to a degree that would interfere with her becoming pregnant. Nothing was palpated in the vaginal fornices or in Douglas's *culdesac*. There was no discharge of blood from the cervix: the latter was patent and free from laceration and erosion. The uterine sound was passed through the cervix as far as the internal os, to ascertain the patency of the latter, but did not enter the cavity of the body of the uterus. While the history is that of ectopic gestation, yet there is nothing suggestive of that condition upon physical examination of the pelvis. There are, however, sensitiveness and resistance of the left pelvic brim on palpation.

Examination on February 14th revealed a mass in relation with the left adnexæ high up on the pelvic brim. The Abderhalden was mildly positive in two tests.

COMMENTS

DR. MURPHY (February 14, 1916—5.30 P. M.): The leukocyte count at present is 21,400—a rapid increase of nearly 6000 within the last two hours. The patient's history does not suggest an

attack of appendicitis: there was neither nausea nor vomiting. In the menstrual irregularities the history is typical for ectopic gestation, but the physical findings were negative.

OPERATION

[Exposure of pelvic viscera through a celiotomy incision.] . . . The trouble is wholly on the left side: the abdomen con-

Fig. 102.—At "A" lumen of tube was completely obliterated, showing how impregnation had to take place through fimbriated end *via* opposite tube.

tains a large quantity of fresh blood, but few clots. The left tube is situated above the brim of the pelvis, is ruptured, and the fetus has escaped (Fig. 102). The tube is still bleeding. It was removed, and the stump embedded in the usual way. The clots were removed from Douglas's pouch. The tube on the right side

is patulous. [Left tube removed; sponges and instruments accounted for; incision closed in usual manner without drainage.]

POSTOPERATIVE COMMENTS

It is now apparent why I could not feel the distended left tube in the pelvis at the time of the physical examination, four days ago: it was drawn up out of the pelvis and fixed by adhesions to the outer side of the pelvic brim, thus being beyond range of the palpating finger in the vagina. The site of fixation of the tube was exactly where the patient located the pain. The clinical history was in complete accord with the operative findings.

Examination of the left tube showed that it was occluded about an inch and a half from the cornu of the uterus by the binding of it to the pelvic wall. This impregnation took place on the fimbriated side of this occlusion, which leads one to ask, How did the spermatozoön arrive in this position? It could not have come through direct from the uterus. It must have come through the right tube, was taken up by the left, and fertilization of the ovum, which had already been arrested at the point of constriction, took place in the left tube. That is a beautiful illustration of this method of fertilization. This case accentuates the significance of the clinical course of the disease, even to the operative stage, without being able to confirm the diagnosis by physical findings, and is most instructive from that standpoint.

Owing to the patency of the tube on the right side there is nothing now to interfere with subsequent impregnation of the uterus.

The head of the patient's bed will be elevated for eight inches.

Postscript (March 1, 1916).—It is now sixteen days since the operation was performed. The stitches were removed five days ago, and healing had taken place *per primam.* The patient's convalescence has been uneventful.

CASE III

CLINICAL HISTORY OF PATIENT

The patient, twenty-nine years of age, was admitted to Mercy Hospital February 18, 1916. The family history is negative.

Menstruation began at sixteen years of age, is regular, of the twenty-eight-day type, painless, and requires one or two napkins a day. There have been no miscarriages.

In 1910 the patient had an attack of typhoid fever.

In 1911, after amenorrhea of seven months' duration, the patient had an attack of "peritonitis"; the uterus was curetted and found unimpregnated. Seven months after the attack of "peritonitis" the left tube and ovary were removed, together with a "mass" the size of an orange: no microscopic examination of the mass was made.

On October 12, 1915, a menstrual period began and pursued a normal course. The next two monthly periods—those of November and December—were missed: during these two months, while there was no morning sickness, yet the breasts were engorged and painful, and the abdomen was slightly distended; there was pain in the right lower quadrant of the abdomen, and the patient was dizzy and fatigued.

On December 25th, while being driven to the railroad station, the patient was suddenly attacked by a severe, sharp pain in the right lower quadrant of the abdomen: she was not nauseated and did not vomit. A hypodermic injection of ¼ grain of morphin was given, and the patient was put to bed. The temperature and pulse-rate were not taken.

On December 27th there was a very slight discharge of blood from the vagina—so slight that it required but one napkin a day. This very slight bloody discharge occurred daily until January 16, 1916, when the patient had what she regarded as a normal menstrual period. During these three weeks fever, chills, and accelerated pulse were absent.

On January 20th the patient had an *agonizing pain* in the right lower quadrant of the abdomen: thereafter she vomited every fifteen minutes, night and day, for three weeks. The temperature was normal; the pulse, 90.

Since January 16th there has been a scanty flow daily, requiring from one to three napkins a day.

On February 14th,—four days previous to admission,—on

account of the continuing hemorrhage, the uterus was curetted, but no microscopic examination of the tissue removed was made.

Examination showed that the cervix was slightly enlarged and the uterus soft. A needle inserted through the vaginal fornix withdrew no pus. The Abderhalden test was positive.

COMMENTS

DR. MURPHY (February 21, 1916): What is the matter with the patient, doctor?

INTERN: The history is very suggestive of ectopic gestation.

What was there in the history that makes you think of ectopic gestation?

The patient missed two successive periods in November and December: her last normal menstrual period began October 12th. On December 25th she had agonizing pain in the right lower quadrant of the abdomen, and a little later noticed a scanty flow of blood.

Was a membrane discharged?

There was none.

Why did I ask that? What do I mean by a "membrane"?

A decidua.

Yes, a decidua, the presence or absence of which bears upon the diagnosis between uterine and extra-uterine pregnancy, respectively, although at times there is a pseudo-decidua in the latter. The uterus was curetted long after the initial symptoms, but no decidua was examined for. On summing up, it is now four months and nine days since the patient had her last normal menstrual period; and for two and one-half months there was no disturbance other than that due to engorgement of the breast. Did she have any pain from October 12th to December 25th?

No, sir.

That is very exceptional for a case of ectopic gestation, in which the rule is that between the fifth and the seventh week after the last normal menstrual period sharp, shooting pains appear, become more and more severe, and eventually simulate true labor pains: the shooting pains result from rapid distention of the tube.

According to location there are three varieties of ectopic gestation—the interstitial, the ampullary, and the ovarian. In the interstitial variety impregnation of the ovum takes place in the isthmus of the tube, whence the impregnated ovum may become displaced outward through the ampulla, infundibulum, and ostium abdominale into the peritoneal cavity (*abdominal type*); or by rupture to a position between the two peritoneal layers of the broad ligament (*intraligamentous type*, Figs. 103 and 104); or

Fig. 103.—The ovum imbedded under the peritoneum of the broad ligament (Hirst and Knipe).

inward through the pars uterina into the uterus, thence pursuing the normal course of uterine gestation (*intra-uterine type*). In the ampullary variety the commoner type is the abdominal, from rupture of the tube and discharge of the embryonic capsule into the free peritoneal cavity, as occurred in this case (*abdominal type*); less frequently this variety develops into the *tubo-ovarian type*. The latter, together with the *ovarian variety*, is the rarest of all.

The etiology of tubal retention of the ovum is given in the classification which we have had placed upon the board. (See

table.) [Here reviews history of preceding case.] . . . After leaving the ovary, the ovum may wander around in the abdominal cavity and eventually enter a tube, where, owing to one of the causes mentioned, it may become imprisoned (as in previous case) after impregnation, thus giving rise to tubal pregnancy.

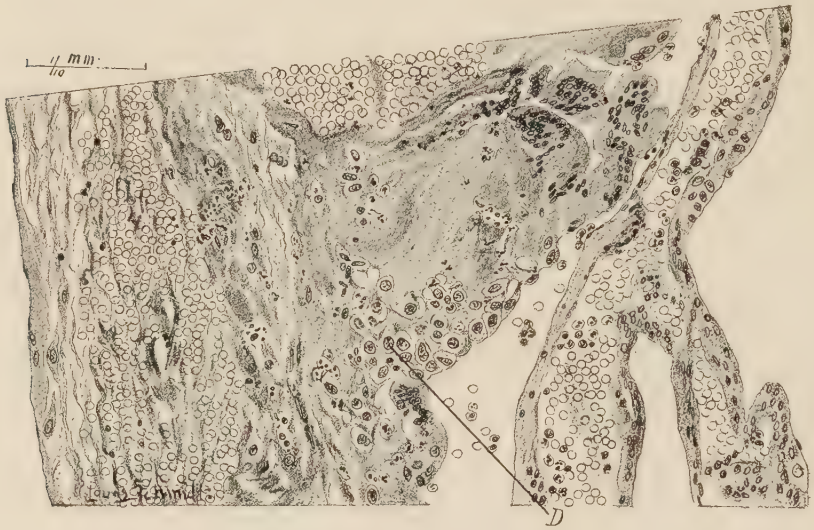


Fig. 104.—Decidual cell development in connective tissue of the broad ligament: *D*, Decidual cells (Hirst and Knipe).

ECTOPIC GESTATION

(Extra-uterine Pregnancy)

Causes of extra-uterine arrest:

A. Intratubal obstructions.
   1. Polypus.
   2. Diverticula (most frequent).
   3. Strictures.
   4. Atresia and migration.

B. Extratubal.
   1. Deformities.
   2. Adhesions, peritoneal.
   3. Salpingitis.
   4. Appendicitis.*
   5. Uterine myomata.

* Neild, of Shanghai, reports a case of unruptured right-sided tubal pregnancy associated with chronic appendicitis (*Lancet*, March 25, 1916, 676).

Varieties:

1. Ampullary:
   (*a*) Tubo-ovarian.
   (*b*) Abdominal.
2. Interstitial:
   (*a*) Abdominal.
   (*b*) Intraligamentous.
   (*c*) Intra-uterine.
3. Ovarian.

Symptoms: Often long period follows latest pregnancy.

1. Intermittent pains in pelvis of stabbing character; occasionally morning sickness, mammary pains, etc.
   Symptoms (*a*) Before rupture.
   (*b*) After rupture.
2. Passes next menstrual period.
3. Lancinating pain in pelvis with a menstrual show and then expulsion or "labor" pains with occasional passage of membranes—decidual casts (recurrent "atypical menstruation").
4. Five to seven weeks from last normal menstruation sudden severe expulsion-pains in the pelvis, with nausea, vomiting, pallor, and often collapse (due to rupture of tube and hemorrhage).
5. Physical signs:
   (*a*) Tender tumor in fornix or pouch.
   (*b*) Flatness on percussion.
   (*c*) Distention of abdomen.
   (*d*) Vaginal show.
   (*e*) False abortion—false labor.
   (*f*) Softening of cervix; enlargement of uterus and of breasts.

The first is the commonest primary manifestation of trouble.

Time of rupture:

Usually five to seven weeks; practically always before twelfth week; occasionally goes to full term.

Abdominal gestation Delivery False labor
Lithopedion

Prognosis:

Not operated, 68.8 per cent. mortality (Schauta).
Operated and non-operated, 28 per cent. (Veit).
Operated (Johns Hopkins), 5 per cent.

Time for operation:

As soon as the diagnosis is made, and preferably in the preperforative stage, as urged by Dorland (*Jour. Kansas Med. Soc.*, November, 1915).

In 1911 this patient was operated upon for left-sided ectopic gestation: the tube and ovary were removed, together with a hematoma; we should, therefore, expect to encounter adhesions.

Diagnosis: Tubal pregnancy with rupture; hematoma.

OPERATION

[Exposure of the pelvic viscera through a celiotomy-incision revealed the absence of the left tube and ovary and the presence of adhesions in their stead. On the right side of the pelvis a large, organized hematoma was found in relation with the right tube: the tube had ruptured and the hematoma had now become fairly well encapsulated, so that there was no free fluid in the peritoneal cavity—just sanguineous fluid. (This case again shows from the clinical course and the physical findings how one aids the other, when there is a discrepancy in the clinical course in arriving at a correct diagnosis.) The tube was dilated in its ampullary portion, while its fimbriated extremity was firmly adherent to the caput coli, which, together with the sigmoid flexure, covered over the hematoma. The fimbriated extremity of the tube was carefully freed from the caput coli, the mesosalpinx and uterine extremity were ligated, and the tube was removed; the ovary was permitted to remain; the sigmoid flexure was freed from the hematoma and the latter was removed. After taking stock of sponges and instruments, the celiotomy-incision was closed without drainage.]

POSTOPERATIVE COMMENTS

Owing to the firm adherence of the fimbriated extremity of the tube to the caput coli, it is not unlikely that a former attack of appendicitis was the underlying causative factor of this patient's state of ectopic gestation.

This patient should menstruate regularly and in practically the normal way. She should not suffer from the symptoms of her premature menopause, which might have given her enormous inconvenience had the remaining ovary been removed.

Postscript.—Progress of the case was uneventful.

CASE IV

CLINICAL HISTORY OF PATIENT

THE patient, twenty-five years of age, was admitted to Mercy Hospital February 19, 1916. The family and past histories are

negative. Menstruation began when the patient was fifteen years of age, is of the thirty-day type, painless, lasts from four to six days, and requires three napkins a day. The patient has one child, who is living and well: there have been no miscarriages or abortions. Retroversion of the uterus was corrected by a pessary three and one-half years ago.

On January 1, 1916,—seven weeks ago,—the patient had the last normal menstrual period: the duration was five days.

On January 9th—four days after the termination of the normal menstrual period—she noticed a slight discharge of bright-red blood, soiling one napkin that day. The next day the quantity was unchanged, and continued so.

On January 19th, at 7.30 P. M., the patient was suddenly attacked by an *agonizing pain* throughout the abdomen: so severe was the pain that she fainted, and a hypodermic of morphin was required. She vomited that night and the next morning: fever and chills were absent. She remained in bed ten days, during which time the flow continued about the same: fever and chills were still absent. From January 29th to February 5th she was up and about, but felt very weak.

On February 5th, at 12 P. M., the patient had severe pains throughout the abdomen and in the lower part of the back, and chilly sensations two or three times, but no fever. This attack of pain, too, was so severe that a hypodermic of morphin was required. The next morning she vomited several times, and again on the following day: she did not, however, take to bed.

On February 9th a series of treatments to control the flowing was begun and continued until February 13th: at each treatment the vagina was sprayed with iodin and packed with gauze.

Since February 13th the patient has been up and about.

There has been neither morning sickness nor enlargement of the breasts, although the latter were slightly sensitive during her ten days' stay in bed after the attack which began on January 19th.

Examination on February 19th shows that the right vaginal fornix is perfectly free; that the uterus is soft and somewhat enlarged; and that there is a mass high up on the left side, behind

the uterus: so tender is this mass that the patient winces when it is touched. The Abderhalden test is positive.

COMMENTS

Dr. Murphy (February 21, 1916): Is this a case of uterine or extra-uterine pregnancy? If the former, is there a pelvic tumor which is responsible for the flow? From all appearances the uterus is enlarged sufficiently to correspond with a normal pregnancy which had existed since December 1, 1915, yet packing of the vagina to check the flow did not bring on a miscarriage.

The mass on the left side carries the uterus up with it; and while it may not be a distended tube, yet the history is typical for ectopic gestation.

OPERATION

[Exposure of the pelvic viscera through a celiotomy incision revealed that the right tube and ovary both were free from adhesions and normal in appearance. The left tube had ruptured near the fimbriated end, and a large hematoma had formed, which was capsulated and firmly adherent to the sigmoid. In freeing the adherent sigmoid from the gestation-sac, a portion of the latter was, for safety's sake, separated and left attached to the former. The left tube was ligated and removed in the manner described in the preceding case (p. 516), but the ovary was retained. No raw peritoneal surfaces were left remaining, but were covered over. After taking stock of sponges and instruments, the celiotomy incision was closed without drainage.]

POSTOPERATIVE COMMENTS

In this case the hematoma has been of long standing. Given a case of acute perforative ectopic gestation: with the opened abdomen before you and blood welling up right briskly through the celiotomy-incision, how would you control the hemorrhage in the shortest possible time? Pass the hand rapidly behind the uterus and then along the broad ligament of the side involved; free the friable adhesions; roll the tube and ovary forward, and have an assistant place an eight-inch clamp on the broad ligament

close to the uterus to control the uterine vessels, and another on the outer portion of the broad ligament, to control the ovarian vessels. Thereupon the clots may be removed and the operation terminated without undue haste. If the patient has lost much blood, intravenous infusion of normal saline solution may be given just as soon as you begin to go to work on the case. Drainage is not necessary unless you are fearful of your asepsis.

The patient is still capable of child-bearing, as the other tube is free from adhesions and patent.

Postscript.—The case progressed uneventfully.

(The "Abderhalden Test in Tubal Pregnancy" was considered in vol. iii, April, 1913, 206–10.)

The accompanying tables are taken from an unpublished paper of Dr. John B. Deaver, of Philadelphia:

TABLE I.—DIAGNOSIS MADE IN 162 CASES OF ECTOPIC GESTATION OPERATED UPON AT THE GERMAN HOSPITAL, PHILADELPHIA, IN A DECAD (DEAVER)

Ectopic pregnancy	96 cases
No diagnosis	29 "
Lacerated cervix	1 case
Chronic appendicitis	5 cases
Salpingitis	7 "
Cystic ovary	3 "
Acute appendicitis	5 "
Pyosalpinx	6 "
Carcinoma, uterus	2 "
Fibroid uterus	3 "
Abortion	1 case
Endometritis	4 cases

TABLE II.—THE OPERATIONS PERFORMED

Left salpingo-oöphorectomy	43 cases
Right salpingo-oöphorectomy	57 "
Double salpingo-oöphorectomy	16 "
Appendectomy	70 "
Hysterectomy	9 "
Left salpingectomy	17 "
Right salpingectomy	29 "
Double salpingectomy	2 "
Left oöphorectomy	4 "
Myomectomy	1 case
Marsupialization of sac	1 "

PYOSALPINGITIS, BILATERAL—CELIOTOMY; DRAINAGE

Summary: Clinical history of patient; operation—celiotomy followed by pelvic drainage for unsealed pus-tubes; comments—analysis of history; streptococcic peritonitis.

CLINICAL HISTORY OF PATIENT

The patient, twenty-two years of age, was admitted to Mercy Hospital May 25, 1915. The family and past histories are negative. Menstruation began at sixteen years, is regular, of the twenty-eight-day type, and lasts four or five days.

The patient has been married for three years: since the time of her marriage there has been leukorrhea, which at times causes much burning and scalding upon urination. One year after the marriage she had one miscarriage. A child was born nine months ago: the menses reappeared four months later and have been irregular, prolonged, and painful since. Owing to the dysmenorrhea the cervix was dilated, but the uterus was not curetted. The latest period has just been terminated.

On May 14, 1915,—eleven days ago,—the patient was suddenly awakened by a sharp, shooting pain in the right iliac region. She vomited once after taking a dose of castor oil. Soon the abdomen became tender and remained sore all day. There were no chills, but the next day chilly sensations were present. During the second day after the attack she stayed in bed, and in the evening was again attacked by abdominal colic, but did not vomit. The first attack began while the patient was menstruating: the flow continued for the next three days and then stopped. On the third and fourth days after the first attack she felt better, but the abdomen remained tender.

On May 18th the left iliac region became tender, and several times sharp pains appeared in that zone: these pains lasted two days, but were unaccompanied by vomiting. Menstruation

began on the same day, lasted two days, and then stopped. The abdomen remained very tender.

On May 22d the patient flowed a little and the next day passed a few small clots, whereupon the flowing stopped. On the twenty-fifth there was a show of blood again.

Since May 14th, when the first attack of colic began, the abdomen has remained tender, and at times sharp, shooting pain appeared in the right iliac fossa. The bowels have been moving daily after the use of cathartics.

Examination of the blood on admission revealed 16,600 leukocytes. Urinalysis showed trace of albumin, but neither sugar nor casts: there were from 60 to 80 white cells to every $\frac{1}{6}$ objective microscope-field, but no red blood-cells.

Fig. 105.—Pyosalpinx.

Bimanual pelvic examination revealed a mass of infiltration in Douglas's *culdesac*.

OPERATION

[The condition of the pelvic viscera was as follows: the uterus was surrounded by adhesions; both tubes contained pus (Fig. 105), which flowed from their fimbriated ends, showing that the latter were patent. Examination of the pus from these tubes showed that it was not a Neisserian infection, but that it was an acute involvement of the tubes in which as yet there had been no closure of the fimbriated ends. Pus from both tubes showed streptococci and B. coli. Owing to the patient's youth, as well as the patency of the fimbriated ends, the tubes were not removed,

but drainage of the pelvis was provided for, and the celiotomy wound was closed. The operation was performed by Dr. Golden, and during its progress Dr. Murphy discussed the history with the intern as follows.]

COMMENTS

DR. MURPHY: I have not examined this patient because she was admitted last week during my absence from the city; but I shall try to build up a diagnosis from the history as recited by the intern. How old is the baby?

INTERN: Nine months.

For how many months did she not menstruate?

For four months following the birth of the child.

Did she nurse the child?

She did not say.

You should have found out. Was that a normal flow on the fourteenth?

No, sir.

Let me check over the history until I show you all its defects. There is no record of the condition of the last menstrual period preceding May 14th. The patient menstruated May 1st and began to flow again on May 14th. Did she menstruate on April 1st?

Yes, sir, she did.

That was six weeks prior to May 14th. How many days did she flow, beginning May 1st? In order to exclude ectopic gestation we must know the date of the last normal menstruation preceding that. The menstrual period at which the patient became pregnant may deviate a little. At the next four-week period patients with ectopic gestation may flow a little, but it is never a normal menstruation: it is usually postponed to five, six, seven, or ten weeks. But the great bulk of ectopic gestations undergo rupture between the first days of the fifth week and the last days of the sixth, so that the date of the last normal menstrual period is always a definite starting-point in the diagnosis of this condition. Now it is evident why this patient should have a deviation in her menstruation if she nursed the baby, and why she

should not have, if she did not nurse the baby. What began first, the flowing or the pain?

I have no record of that.

You ought to have it. When a tube is about to rupture, what should the patient have first? The pain. Did she have pain on the first day of May? Patients with an impregnated Fallopian tube always have stretching pains as the tube dilates, and because of these pains a large proportion of cases of ectopic gestation is diagnosed as gradually progressing acute appendicitis. What is the matter with the patient?

She may have appendicitis, pyosalpingitis, or ectopic gestation.

Which is it?

She has been complaining of a discharge for the last three years, and from the history of this previous infection I thought that she might have pyosalpingitis.

What was the nature of her previous infection?

Three years ago, after she was married, a yellowish vaginal discharge began and has continued to the present time: this discharge was accompanied by burning on urination.

What else? Did she have frequent urinations at the time she got the acute vaginal discharge and the acute irritation in the vagina?

She said she had increased frequency of urination at one time.

Did she get this infection then? Did the Neisserian infection travel up into the tubes at that time and set up pyosalpingitis? Does it state in the history that she had any other pain across the abdomen at that time?

No, sir.

Had she had an infection of the Neisserian type she should not have become pregnant. Was it acute salpingitis that made its appearance on May 14th, and was the accompanying pelvic peritonitis caused by a tubal infection? Was the infecting agent B. coli, pneumococcus, staphylococcus, or streptococcus? Two years ago last winter we had a number of cases of streptococcic infection of the lower abdomen, the primary source of which was the throat, the abdominal atrium, the appendix. I operated

upon two of these cases, but in neither was the appendix perforated, for in this type of infection the streptococci run through the cellular tissue, just as water runs through a sieve. In practically all these cases streptococcic tonsillitis was the primary source of the metastatic peritonitis, and Dr. Miller, of this city, believed that the tonsillitis came from infected milk. Peritonitis is not commonly associated with tonsillitis or pharyngitis. The majority of these cases of streptococcic "peritonitis" die whether operated upon or not, for the infection is not on the surface of the peritoneum, but behind and beneath it (subperitoneal cellulitis), so that celiotomy has but little to offer.

[The remainder of the talk had to do with the subject of pelvic infections, for which consult vol. i, December, 1912, 807–824.]

Reporting a case and reviewing the literature on "Spontaneous Rupture of Pyosalpinx into the General Peritoneal Cavity, Producing Acute Diffuse Peritonitis," Bonney (*Surg., Gynec. and Obstet.*, November, 1909, 542–50) concludes as follows:

"1. It is a very rare accident [31 authentic cases up to 1909].

"2. In the severity of its symptoms it usually resembles other forms of perforative peritonitis.

"3. It conforms to the general rule obtaining in such cases, that the earlier operation is performed, the greater is the chance of recovery.

"4. It is a very momentous accident, having a mortality of 30 per cent., even in those cases in which operation is made during the first twelve hours.

"5. It should be considered as the possible causative agent in all cases of acute general peritonitis of obscure origin occurring in females.

"6. Its proper treatment is immediate operation."

Postscript.—Progress to recovery was slow but complete.

CASE I.—NEOPLASMS OF BOTH KIDNEYS; GASTRIC ULCER—EXPLORATORY CELIOTOMY. CASE II.—SARCOMA OF RIGHT KIDNEY—EXPLORATORY CELIOTOMY

Summary: Case I.—Clinical history of patient; comments—discussion by Dr. Mix; operation—gastric ulcer found at pylorus; neoplasm present in each kidney; organs not disturbed; postoperative comments—correlation of operative findings with history; nephrectomy: transperitoneal *vs.* lumbar; the phenolphthalein test; removal of a specimen and of either kidney contraindicated—reasons; danger of removing a kidney in direct proportion to its secreting power; postoperative treatment.

Case II.—Clinical history of patient; comments—examination and plan of operation; diagnosis of lesions of genitourinary tract by examination of urinary sediment; operation—neoplasm of right kidney found, but not disturbed; postoperative comments—neoplastic invasion of renal vessels.

CLINICAL HISTORY OF PATIENT

A MALE, forty-nine years of age, was admitted to Mercy Hospital October 15, 1915. The family history is negative.

The initial symptoms of the present malady occurred thirty years ago: ever since then similar attacks have manifested themselves every three or four months with no relation to the season of the year, and from four to six weeks in duration. Each attack is characterized by dull pain, coming on three hours after eating and lasting until the next meal, when food-relief is obtained: the pain is never present at night. The patient eructates a large quantity of gas, but is never nauseated and has never vomited during an attack. He is tender over the "stomach." The bowels are habitually constipated; the stools are never black.

The patient has lost 40 pounds in weight during the past eighteen months. He is very nervous.

The Wassermann test is negative. The urine is negative. A functional renal test shows only 45 out of a normal of 50.

COMMENTS

DR. MURPHY (October 21, 1915): There is a large mass in the right hypochondrium, quite apart from the liver: it must measure at least five inches in length, extends down beyond the costal margin, and moves with respiration; it invades the loin, where it may be distinctly palpated, thus from its position suggesting a renal tumor, such as congenital polycystic kidney or hypernephroma. It is lobulated, smooth in front, and as hard as wood.

The history is long and complex, and contains many points of interest. Strange to say, while many laboratory treatments have been given, no physical examination of his abdomen to determine the presence or absence of tumor was ever made until the patient came under our care. While he has a clinical history of duodenal ulcer extending over approximately a period of twenty years, the duration of the tumor is entirely unknown, as it was not recognized until the present time. Dr. Mix will discuss these interesting features with you.

DR. MIX: The patient is a man who is endowed with a good deal of intelligence. Sometimes such an endowment works to the disadvantage of the examining physician, however, because the patient's memory of his symptoms is usually very good and his ability to expatiate upon them most excellent. The great danger is that such a patient will carefully and elaborately describe such a maze of symptoms that the examining physician is apt to be lost in a labyrinth in trying to arrive at a diagnosis. Unfortunately, notwithstanding their intelligence, such patients have not had a medical training, and, therefore, have a tendency to exaggerate things of no importance.

This patient told me that he had been bothered with his stomach for thirty or thirty-five years. For years he has been having periodic attacks lasting from four to six weeks at a time, and separated by latent periods of three or four months or even longer. Such periodic recurrences of gastric symptoms should always arouse the suspicion of the presence of a duodenal ulcer or of an ulcer in the pyloric zone of the stomach. Periodicity

occurs in gall-bladder infections, but the periods of involvement are short, and the periods of remission in the early history rather long, but in the later history rather short. Where the patient makes no record of the matter of periodicity, the presumption from the symptoms is that he is more liable to be suffering from duodenal or pyloric ulcer than from a gall-bladder infection. The patient states that the season makes no difference in regard to his seizures. In other words, he has failed to notice the spring and fall exacerbations usually found in the history of the ordinary duodenal ulcer case.

The long duration of his history—namely, thirty or thirty-five years—is indicative of the presence of duodenal, rather than gastric ulcer. The usual history of gastric ulcer is that it runs a variable length of time,—anywhere from one to three or four years,—and that it even gets well for several years, subsequently breaking out again. On the other hand, duodenal ulcer may be more or less periodically active almost indefinitely, without a long intermission of several years.

The most important symptom of any case of ulcer is *pain or distress after eating*. This patient states that in the past the distress came on at a definite time after his meal—usually two or three hours, and that this pain lasted until he ate his next meal. Such a relationship between the pain and the time of occurrence is very characteristic of duodenal and pyloric ulcer, but is not characteristic of gastric ulcer. In gastric ulcer the pain comes on almost as soon as the food enters the stomach and stops when the food has left the stomach. In duodenal ulcer the patient feels at his best when food is in the stomach, but in gastric ulcer feels *worse* with food in the stomach. Another important point is that during the past he maintained his weight very well. It is true that during the last eighteen months he lost 40 pounds. Up to the last eighteen months his weight was practically constant. We shall account for his loss of weight subsequently.

The patient also complains of gas and of belching. Such complaints have little diagnostic value, because we meet with them in gastric ulcer, duodenal ulcer, chronic appendicitis, chronic cholecystitis, pericholecystitis, and periduodenitis. Since these

symptoms of gas and belching have little or no diagnostic value, it is hardly worth while to pay any attention to them. They are almost invariably important in the patient's mind, and no doubt are very distressing, but their value as symptoms of diagnostic importance is minimal. Far more important is the fact that he has not suffered from nausea and vomiting. The classic symptomatology of duodenal ulcer does not show nausea or vomiting unless there should be involvement of the duodenal or of the regional peritoneum. It is only when duodenal ulcer attempts to perforate that it produces vomiting. On the other hand, vomiting in gastric ulcer is fairly common. It seems as though the ulcerous stomach is relieved by the escape of its contents and that, therefore, it exerts its efforts in order to free itself from the irritation.

In this case, also, it is a fair inference that no pyloric stenosis is present. If the patient had at the pylorus an ulcer which had undergone secondary cicatricial contraction, it would have so narrowed the pylorus that at the end of this long period of time there would have been a secondary dilatation of the stomach. By this time such a dilatation surely would have been associated with vomiting. The mere duration of the case and the absence of vomiting are practically proof-positive that there is no pyloric stenosis.

Two other symptoms of great import appear in his history: the first is constipation, which for years has been a favorite source of complaint on his part. In all cases of ulcer—whether gastric or duodenal—constipation is extremely frequent. On the other hand, in gall-bladder infection constipation is not a symptom; it, therefore, has frequently a very great differential value. In this case we believe it indicates the presence of duodenal or pyloric ulcer, rather than any gall-bladder infection.

The other characteristic symptom which this patient does not show is hemorrhage. About 20 per cent. of ulcers of the duodenum is associated with hemorrhage at some time or another. So far as he knows this patient never had a black or tarry stool, never passed any blood, either red or decomposed, and never vomited any blood. We are, therefore, forced to make our diag-

nosis without the support of either emesis of red blood or passage of melena.

In this briefly summarized history no mention was made of the patient's neurasthenic state. Out of the wealth of details which he recounted there can be discerned a large group of neurasthenic symptoms: in fact, he has been called a "neurasthenic" for thirty or thirty-five years. He has gone from one physician to another, and from one sanitarium to another, and evidently has been hailed everywhere as a "neurasthenic." Indeed, his story alone certainly arouses the presumption of such a diagnosis. Among other things, he has followed in the footsteps of many neurasthenics in going to one of the eastern prize-fighting camps, where he spent a summer two or three years ago to his great advantage. While there he says he gained several pounds in weight and came away practically cured. Such a recital would lead almost any one to believe that an individual of this type had all his troubles in his head, and yet such a belief would be erroneous. The fact is, that vast numbers of cases have in the past been labeled "gastric neuroses" when they should have been labeled duodenal ulcer. Whenever you are tempted to make a diagnosis of "gastric neurasthenia" stop and ask yourself whether the patient is suffering from duodenal ulcer. There is no organic disease of the abdomen which resembles "neurasthenia" so closely as duodenal ulcer. The duodenal ulcer patient is always complaining. He is always belching gas, always has pain, and always taking bicarbonate of soda; he is always trying first this kind of food and then that kind; he is always constipated, and yet manages to maintain a fairly constant weight. The reason for his good weight is based on the fact that he feels better when food is in his stomach, so that he is tempted to eat; but this very good weight is the thing which, in the minds of those not instructed in the symptomatology of duodenal ulcer, raises a strong belief that the patient is a "neurasthenic." Therefore, in presenting the symptomatology of duodenal ulcer very strong emphasis should be placed upon the neurasthenic state of the patient.

There is still a very important negative element in this patient's history, that is, the *lack of evidence of constitutional infec-*

tion. There is no complaint of joint disturbances, "muscular rheumatism," headache, fever, or chills. There is no evidence that he ever had an infection in the gall-bladder, appendix, prostate, urinary bladder, urethra, or kidneys. These negative findings as to infection are extremely important. No case of chronic cholecystitis or gall-bladder infection exists which does not show at some period in its course the well-known footprints of infection. In this patient's history you will find throughout no trace of constitutional infection. Taking into consideration his history and the absence of specific signs of infection, the diagnosis of duodenal ulcer seems to be correct.

Inasmuch as the patient exhibits neurasthenic stigmata; inasmuch as he has been a victim of gastric disturbances for a period of thirty or thirty-five years; inasmuch as his periods of exacerbation have been of from four to six weeks' duration—separated by intermissions of three or four months; inasmuch as he has had pain coming late after meals, lasting until the next meal and relieved by the ingestion of food; and inasmuch as he is very constipated and has shown no nausea, no vomiting, nor any signs of infection—upon these grounds we feel justified in making a diagnosis of ancient duodenal ulcer. The ulcer may be close to the pylorus, but from the symptomatology one would be justified in saying that it is not close to the pylorus, but a short distance from it. In this connection a general diagnostic rule may be stated, namely, the farther the ulcer is from the pylorus, the later is the onset of pain and the more prominent the symptom of food-relief.

Finally, there are the laboratory findings to consider. Examination of the Ewald test-meal showed merely the presence of hyperchlorhydria. Such hyperchlorhydria is characteristic of duodenal or gastric ulcer, but it is not imperative that hyperchlorhydria should exist if the diagnosis is to be made. Very many cases of ulcer are encountered where hyperchlorhydria has not been present. There was also absence of blood in the feces and stomach-contents: this means nothing. It is by no means probable that we are examining the patient at a time when his ulcer is very active. At the present time, from absence of blood

in the feces, it is altogether probable that the ulcer is healed over.

At this juncture we are able to take up an entirely new set of findings and symptoms. For the last eighteen months the patient has been steadily losing weight: in all, 40 pounds. During the eighteen months he has consulted several physicians, but, curiously enough, none took the trouble to examine his abdomen until he consulted Dr. Murphy. The presumption is that the "neurasthenic" story was related and listened to, but not heeded. On examining his abdomen we found a very large tumor situated beneath the right costal margin and moving up and down with respiration as though it were a part of the liver. It extends downward almost to the iliac crest. It has no sharp edge such as it would have were it an enlarged liver; it is not possible to get the finger hooked under it from below, nor to insert the finger between the upper margin of the tumor and the costal margin and liver. From these facts alone it is quite certain that the tumor is not formed by an enlarged right lobe of the liver or an hepatic abscess.

For the last few months the patient has been complaining of pain in the right iliac and right lumbar regions. It was noted that the pain is referred both anteriorly and posteriorly. The tumor can be felt well around in the side of the lumbar region: furthermore, its lower edge seems to be somewhat lobulated and round. A tumor in this locality, which is movable with respiration, distinct from the liver, situated below it, and which extends into the right side, raises the presumption that it involves the kidney by some process, malignant or cystic.

It cannot be a tumor of the stomach because it lies too far to the right and too low down, unless it has been displaced by a dilated stomach full of retained fluid. The only tumor of the stomach which it could possibly be is carcinoma of the pylorus; but pyloric cancer the size of this tumor would have produced such a high degree of obstruction that by this time there would have been secondary dilatation and a great deal of vomiting. The tumor cannot be a retroperitoneal tumor of any variety, because it is not fixed to the posterior abdominal wall, but moves readily with respiration, just as the kidney does.

There are two or three things which the tumor might be—cystic kidney, sarcoma, or hypernephroma. Hypernephromata are distinguished by their comparatively large size and liability to form metastases, but particularly by the tendency of these metastases to involve bones. They are further characterized most notably by the presence of blood in the urine. There are, however, numerous exceptions to all these symptoms. Hypernephromata frequently exist without causing hematuria. Furthermore, they are sometimes only semimalignant, that is, lasting four or five years without causing metastases, so that, so far as the symptomatology and physical findings in this case are concerned, the diagnosis of hypernephroma is apt to be just about as accurate as that of any other form of kidney lesion.

Unfortunately, it was not possible to catheterize the ureters: therefore, we are unable to say previous to operation whether the right kidney is putting out very much urine and whether the left kidney is performing its function thoroughly. The Wassermann test was negative, so that there hardly seems to be a syphilitic element.

Sarcomata of the kidney are unusual at the time of life which this patient has reached, but occur more frequently in children under five years of age. Congenital polycystic disease usually manifests itself long before his time of life, so that this is not a very likely diagnosis. The most plausible diagnosis is hypernephroma of the right kidney, though conjectural because we cannot back it up by hematuria or by metastases. The character of the tumor must be settled by operation, and perhaps even subsequent to that: possibly the microscope alone will be able to reveal the nature of the tumor.

We shall, therefore, conclude with the diagnoses of duodenal ulcer and neoplasm of the right kidney, and incline to the opinion that the latter will prove to be a hypernephroma.

OPERATION

[Through a celiotomy-incision exploration of the upper abdomen was begun. The liver was found to be normal. The pyloric zone of the stomach showed the typical white scar of

an ulcer which, upon palpation, proved to be firm and deeply excavated, and therefore possibly malignant: it did not occlude the pylorus. The mass, which was palpated in the loin at the time of the physical examination, proved to be a lobulated, semi-solid, non-adherent tumor of the right kidney, which was probably malignant in nature. The left kidney showed at its upper pole —in the adrenal zone—a firm, hard (wood-like) tumor the size of an English walnut: this kidney itself was small—not over one-third of the normal size. No further operative measures were taken,—the organs were not disturbed,—and, after accounting for sponges and instruments, the celiotomy-incision was closed in the usual manner without drainage.]

POSTOPERATIVE COMMENTS

The history, which was typical for gastric or duodenal ulcer, was cleared up by finding the ulcer in the pyloric zone of the stomach: owing to the involvement of both kidneys by probably malignant neoplasms, we deemed gastrojejunostomy inadvisable.

The findings on physical examination were corroborated by the presence of the neoplasm involving the right kidney: this organ was of such a size that while it could have been removed by the transperitoneal route very easily by merely pushing the colon inward and dividing the posterior parietal peritoneum along the outer, convex border of the kidney, yet to have removed it by the lumbar route would have been a very difficult task. Having determined that the right kidney was involved by a neoplasm we followed the rule to be observed in this class of cases by immediately palpating the left kidney.

One of the dangers of lumbar nephrectomy is the admission of urine into the field during the course of the operation. By the anterior (transperitoneal) method, however, such leakage may be avoided after exposure, ligation, and division of the vessels, by isolating the ureter, clamping it between two forceps and dividing it: then the kidney may be readily rolled out from behind forward. By this anterior route, too, any aberrant renal arteries—of which there may be one or two passing more commonly to the lower pole—can be not only easily detected, but

also just as easily dealt with. Furthermore, in operating on the right side the duodenum can be easily protected. Accidents to the duodenum with large right-sided renal tumors are not uncommon and are always extremely serious.

The functional renal test by the phenolphthalein method showed that the combined output of both kidneys was practically normal; but since we were unable to catheterize the ureters, we were equally unable to determine what proportion of the output each kidney of itself was contributing.

A tissue-specimen was not removed from either kidney for fear of disseminating the suspected malignant neoplasm, which was well encapsulated: let sleeping dogs lie. I dared not remove either kidney because both were involved by neoplasms; and even if the right kidney had been the seat of polycystic disease alone, I dared not remove it because of the aplasic condition and small size of the left kidney,—aside from the presence of the neoplasm in the latter organ,—and the concomitant danger of suddenly burdening it with an overwhelming amount of work.

The danger of removing a kidney is in direct proportion to its secreting power: thus, the removal of a practically normal kidney at once throws a colossal load upon the remaining kidney, and the operative mortality of such a procedure is about 30 per cent.; only a 2 per cent. mortality, on the other hand, follows the removal of a kidney which has undergone cystic or infection-degeneration to such an extent that it is functioning but 2, 5, or 7 per cent. of the normal; while the removal of a renal pus-sac—one, for example, which is as large as one's hat, and therefore has no functioning parenchyma left remaining—carries with it practically no danger at all.

There is great danger in removing a kidney which is so slightly involved by disease that it retains nine-tenths of its normal secreting power,—such, for example, as one which contains a small cyst, small sarcoma, or small abscess,—for here again, just as in the removal of a normal kidney, the load is *suddenly* thrust upon the remaining kidney.

It was these considerations which many years ago led Morris to drain all suppurative renal cases for weeks or months before

extirpating the diseased kidney, so that the work performed by the remaining functioning parenchyma could be *gradually* transferred to the opposite kidney: Morris's adoption of this plan very markedly lowered the mortality of nephrectomy in his own hands.

The patient will be given therapeutic doses of *x*-rays and hypodermic injections of sodium cacodylate.

Postscript (*February 16, 1916*).—It is now four months since the exploratory celiotomy was performed and medication instituted. The enlargement in the right loin, which was due to the renal neoplasm, has become very materially diminished both in front and behind—especially behind. The patient's weight remains about the same.

The discomfort following eating still continues, but is kept under fair control by the use of bismuth, soda, and magnesia. The *x*-ray and sodium cacodylate treatments are to be maintained.

CASE II

CLINICAL HISTORY OF PATIENT

A FEMALE, fifty years of age, was admitted to Mercy Hospital October 19, 1915. The family and past histories are negative. The catamenia occurred two months ago.

On May 20, 1915, while sitting down, the patient suddenly experienced an uncomfortable sensation passing down from head to foot, and immediately afterward felt nauseated, but did not vomit: the sensation lasted for about five minutes. There were no other symptoms.

On May 30th pains of moderate severity and not unlike labor-pains appeared in the abdomen and lasted twenty-four hours, giving way to a dragging discomfort throughout the entire right side of the abdomen.

During the past month the patient has been nauseated and vomited daily—as often as two or three times a day; her appetite is gone, and within the past four months she has lost 50 pounds in weight. She has not been confined to bed, and was able to perform housework up to within the last fortnight; since that time, however, she has felt very weak.

The following symptoms or signs are absent: fever, chills, headache, constipation, urinary disturbances, metrorrhagia, tenderness. Since four months there has been no actual pain, but merely dragging discomfort in the right loin.

Cystoscopic examination revealed no edema or congestion about the orifice of the right ureter. From the left ureteral orifice urine appears at normal intervals. The phenolphthalein test showed during the first hour, 0; second hour, 18; third hour, 17: total, 35—subnormal!

COMMENTS

Dr. Murphy (October 20, 1915): There is a tumor in the right loin with these characters: its lower margin extends across the abdomen as far as the navel and presents a notch similar to that on the lower border of the liver; the left margin permits the hand to pass beneath it clearly and definitely: it is round and hard; the right margin is also round and hard, and presents a definite notch; on displacing the mass downward no apparent flatness appears in the midline: there is no hepatic flatness.

The left kidney is distinctly palpable and two-thirds larger than normal: it is not continuous with the mass on the right side and therefore is not a horseshoe kidney.

Pelvic examination is negative.

When I operate I shall examine the left kidney first, in order to determine the presence of metastases or a concomitant neoplasm; and if, when examining the tumor on the right side, I should conclude that it is a small round-cell sarcoma, but not a hypernephroma, I will not perform nephrectomy, for statistics have shown that operation does not benefit this condition, and that patients live just as long without the small round-cell sarcoma being disturbed.

The clinical history is against the lesion being a renal tumor because there has been no blood in the urine at any time. We dislike very much to schedule a case upon the board as one for exploratory celiotomy, but in this case neither Dr. Mix nor myself could arrive at a diagnostic conclusion.

Upon catheterizing the ureters yesterday it was found that

Fig. 106.—Microscopic findings in Case III. Examination of urinary sediment revealed: Red blood-corpuscles—moderately numerous; pus-corpuscles—abundant, fairly granular, some containing fat.

Epithelia from *P.R.*, prostate—abundant, some containing fat and many endogenous new formations; *D.P.*, ducts of prostate—numerous, some containing fat; *S.V.*, seminal vesicles—few; *E.D.*, ejaculatory duct—few; middle bladder—numerous, some containing fat and endogenous new formations; upper bladder—numerous; deep bladder—moderately numerous, some containing fat; *U.E.*, urethra—moderately numerous; convoluted tubules—few; pelvis of ureter—few; connective-tissue shreds—few; *M.C.*, mucus—abundant; *Z.O.*, zoöglea—numerous; *F.*, free fat—considerable; bacteria—abundant; uric acid needles and concretions—numerous.

Diagnosis made from urinary sediment and confirmed at operation. "Chronic prostatitis, seminal vesiculitis, and cystitis, due to hypertrophy of prostate. Stone: uric acid present, probably in bladder. Mild pyelonephritis." (G. A. Wyeth, N. Y. Med. Jour., Sept. 2, 1911, Fig. 5.)

the flow of urine from the right kidney was diminished in amount: a piece of tissue brought out in the eye of the catheter was examined and diagnosed by the pathologist as round-cell sarcoma.

G. A. Wyeth, of New York, in a very able paper, points out the possibilities of determining the location of pathologic lesions of the genitourinary tract from study of epithelia found in urine (Figs. 106–108). The investigations were carried out in Israel's clinic, in Berlin, and were based upon the method previously described by Heitzmann. Wyeth concludes in part as follows:

"The cases herein described have been selected as best illustrating the results which can be obtained from careful microscopic urinalysis, *since the diagnoses were corroborated by operation;* and others could be cited in which a doubtful clinical diagnosis was entirely cleared up by the microscopic findings in the urine. Such cases prove beyond doubt that, through the differentiation of the various epithelia in the urine, we have a reliable means of locating lesions in the genitourinary tract, regardless of whether the pathologic condition can be diagnosticated or not."

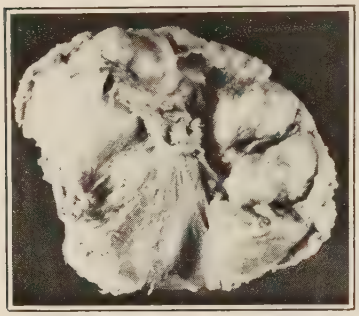


Fig. 107.—Hypertrophy of prostate; diagnosis made from urinary sediment. (See Case III.) Both lateral lobes as large as plums. Middle lobe cherry size. Stone size of cherry seed (G. A. Wyeth).

"In many of these cases no aid is obtained through cellular findings in the urine, as we have shown by careful examinations for years. When they are found they may be of diagnostic value, but they have no negative value.

OPERATION

[Through a celiotomy incision there was revealed a neoplasm involving the right kidney, with small metastatic daughter-tumors proceeding upward along the vena cava as well as a larger mass spreading over the diaphragm. The lesion being inoperable, the incision was closed forthwith.]

POSTOPERATIVE COMMENTS

The pathologist's preoperative diagnosis of sarcoma of the kidney was correct: I must say that it did not seem possible to

Fig. 108.—Tumor of kidney; diagnosticated from urinary sediment. (See Case IV.) Description of preparation taken directly from hospital records: Kidney, 15 cm. long, 10 cm. broad, 6 cm. thick. Outside kidney nodular, especially at upper pole. These nodules evidently represent tumor nodules, and are partly yellow and yellowish red, and partly hemorrhagic in color. In hilus the vena renalis is enormously thickened, 3 to 4 cm. in diameter, filled with light yellow tumor thrombus. On transverse section the upper third is filled with tumor masses, the lowest of these pressing against the wall of kidney pelvis, narrowing same, but not perforating the wall. The tumor nodules show mostly a yellow or red striated color. In the center they are fibrous, cicatricial, and show cellular degeneration. The lower two thirds of cortex and medulla are markedly swollen, moist—details of structure indistinct—and infiltrated by many small abscesses. The mucosa of pelvis succulent and transparent.

Autopsy revealed a nodule in prostate the size of small marble which was diagnosticated by the pathologist as adenocarcinoma. (G. A. Wyeth, N. Y. Med. Jour., Sept. 2, 1911, Fig. 7.)

base an accurate diagnosis upon such a small matter as a piece of tissue that came out in the eye of the catheter. It is strange

that hematuria—which is one of the common continued signs of both hypernephroma and sarcoma of the kidney—was in this case always absent.

The tumor was of rapid growth. Such a sarcoma is liable to invade the renal vessels: when this state of affairs is present, the removal of the kidney by the lumbar route is particularly hazardous, owing to the unavoidable tug during delivery upon vessels already weakened by neoplastic invasion. (The advantages of the anterior or transperitoneal method have been pointed out in the preceding case.)

(For comments upon sarcoma of kidney, ovary, and testis, together with bibliography, consult vol. iv, October, 1915, 921–2.)

The patient will be given the usual palliative treatment for sarcoma—Coley's serum, arsenic, and *x*-rays (*vide* vol. iv, October, 1915, 951–5).

Postscript.—The patient's convalescence was uninterrupted. We have had no information from her since she returned to her home.

VESICAL CALCULUS (TWO CASES)—SUPRAPUBIC LITHOTOMY

Summary: Case I.—Clinical history of patient; comments—variation in the symptom of pain; comparison between frequency of urination in calculus and in prostatic hypertrophy; question of concomitant removal of prostate; synopsis of vesical calculus; methods of detecting stone in bladder; operation—suprapubic lithotomy; postoperative comments—pneumonia as a postoperative complication.

Case II.—Clinical history of patient; comments—importance of early detection and removal of calculus; litholapaxy *vs.* lithotomy; operation—suprapubic lithotomy.

CLINICAL HISTORY OF PATIENT

A MALE, seventy-four years of age, was admitted to Mercy Hospital February 13, 1916. The family and past histories are negative.

In the fall of 1909 the patient noticed that he had to urinate about every hour and a half during the daytime: the urine did not flow at once, but was delayed about fifteen seconds; after the bladder was emptied the flow stopped short, and did not dribble. There was neither dysuria nor hematuria, and the urine appeared normal. During the night the patient urinated three times, and just as often during the day. In the spring of 1910—when the weather was warmer—he had to urinate only every three hours, and during the night but once or twice. At this time the urine was apparently normal. The act of micturition was the same as before, but the patient thought that the stream flowed somewhat more slowly than usual.

In the winter of 1911 urination increased in frequency, and there was difficulty in starting the flow.

In the summer of 1911 the frequency decreased, but the stream flowed with less force.

In the spring of 1912 the patient noticed that the urine was red in color: the next day it was darker; the day after that,

lighter; and on the fourth day the unusual dark color disappeared. There was no dysuria.

In the fall of 1912 urination again increased in frequency, and dysuria appeared for the first time: the pain was mild in character, and was present when the patient forced the urine to flow; when the stream started, the pain disappeared.

Fig. 109.—Colossal stone in bladder.

From the fall of 1912 to December 20, 1915, urination gradually increased in frequency, and the pain somewhat in severity.

On December 20, 1915, while the patient was ill with influenza, he noticed that the urine did not flow as rapidly as it should, and that it was very cloudy. A physician passed a

catheter and two days later a sound, and stated that no stone was present, but that the prostate gland was enlarged and ought to be removed. The case was referred to me as one of enlarged prostate gland, but the clinical course of the case did not correspond with that diagnosis.

Rectal examination revealed mild enlargement of the prostate, but no nodules suggestive of malignancy were palpated. Skiagram revealed a stone the size of a goose's egg in the bladder (Fig. 109), notwithstanding none was detected when the patient was sounded by his attending physician some weeks previously.

COMMENTS

Dr. Murphy (February 14, 1916): The history of the patient's malady extends over the course of the last seven years. A symptom which is at variance with the usual finding in cases of vesical calculus is the time of appearance of the pain: in his case the pain *precedes* urination, occurring during his effort to get the flow started; there is little or no pain after the bladder has emptied itself. This symptom is misleading, and there is a definite reason why it is at variance with the time of onset of pain in the usual case of vesical calculus—the bladder contains a smooth stone the size of a goose's egg, against which it cannot contract with enough force to traumatize the sensitive trigone, upon which the usual small stone is stranded in the ordinary case.

In most cases of vesical calculus the frequency of urination is increased in the daytime and diminished at night—just the reverse of prostatic hypertrophy, in which there is increased frequency at night, but little or no increase during the day.

The prostate gland is not unduly enlarged: the question arises whether or not we should remove the prostate when we remove the stone; prostatectomy in a patient seventy-four years of age is an operation of considerable magnitude. It is my intention, therefore, not to remove the gland unless the intravesical examination shows it to be seriously enlarged: it is much better surgical judgment to free him from the irritation of the stone at the present time and postpone the removal of the prostate, than to perform both operations at one sitting. The number of opera-

tions is an insignificant matter when the patient's safety is enhanced thereby.

Cabot's statistics of lithotomy, as shown in the table, seem unduly high as regards mortality, especially when the mortality of the severer operation—prostatectomy—is but 4 per cent., approximately.

SYNOPSIS OF STONE IN URINARY BLADDER

PHYSICAL AND CHEMICAL CHARACTERISTICS

1. Uric acid.
2. Oxalic acid.
3. Phosphoric acid.

Albuminoid nucleus.
Law of crystallization (Rainey).
Molecular coalescence (concentric).
Conformation—facets.

Etiology:

Constitutional.
Local.

Symptoms:

Sudden stoppage of stream.
Pain—time, etc.; effect of residual urine.
Reflex pain.
Hematuria.
Sounding; details; causes of error.
Cystoscope.
Skiagram.

Treatment and mortality:

	Suprapubic Lithotomy	Litholapaxy	Lateral Lithotomy
Children under 14 . . .	10 per cent.	1.66 per cent.	55 per cent.
Adults 22 to 50	12 " "	3.25 " "	17 " "
Old men . . . . . 15 to 20	" "	6 " "	26 " "

(*Cabot.*)

Complications: Enlarged prostate; infection; foreign body; cancer.

Recurrence: Recurrence of vesical calculi, like recurrence of renal calculi, is much commoner than is generally believed.

Fistulæ.

In establishing the diagnosis of stone in the bladder we no longer employ the sound or the catheter, lest urethral fever should by some chance arise: the substitute for the time-honored stone-sound is the *x*-ray; while in children a stone may frequently be detected by bimanual palpation.

OPERATION

[A sound was introduced into the bladder and struck the stone with an audible click. A suprapubic incision was made through the linea alba, and the pubic heads of the recti muscles were detached and reflected outward. A finger introduced into the space of Retzius palpated the sound through the bladder-wall. The peritoneum was reflected upward, unopened. Two anchor sutures were inserted into the bladder, and the organ was opened between them, the scalpel coming directly down upon the sound. After the urine had flowed out the cavity of the bladder was inspected and a stone detected which measured 3 by 2¼ inches (Fig. 109). The stone was broken and taken out in fragments, thus rendering a large bladder incision unnecessary. Inspection of the mucosa revealed chronic cystitis with *brie*, but no frank infection. The middle lobe of the prostate gland was not enlarged, and there was no evidence of prostatic obstruction or of carcinoma of the prostate or bladder. After accounting for sponges and instruments the incision in the bladder was closed by passing sutures down to the mucosa, but not through it. The anchor stitches were removed, and a drainage-tube was inserted into the bladder. The heads of the recti were restored to the pubic bones, and the laparotomy incision was closed in the usual manner, room for the drainage-outlet being provided for.]

POSTOPERATIVE COMMENTS

In operating upon a patient of such advanced age at this season of the year there is danger of postoperative pneumonia: this winter, however, has been an exceptionally mild one, so that better hospital ventilation prevailed, and we did not have a single serious case of pneumonia up to date, nor a single death from that disease, so far as I know, which is a very unusual state of affairs.

Postscript (*March 6, 1916*).—It is now three weeks since the operation was performed. On March 2d the patient began passing urine *per urethram*, and has so passed some of it daily since. He is in good condition and gets about in an invalid's chair.

CASE II

CLINICAL HISTORY OF PATIENT

A MALE, ten years of age, was admitted to Mercy Hospital April 7, 1915. The family and past histories are negative.

In June, 1913,—nearly two years ago,—the patient noticed for the first time an aching discomfort just above the pubes, and increase in the frequency of micturition—six or eight times during the day and two or three times at night. As time went on both these symptoms became aggravated—the aching discomfort more constant, and the frequency more marked.

At present micturition takes place about thirty times a day and ten at night, the quantity voided each time being about two fluidounces: each act is followed by burning discomfort, and often by a sharp pain, which is referred along the urethra to the bladder. At times, according to the boy's statement, a small quantity of blood and pus is passed. There was no definite history of sudden stoppage of urine.

The patient has lost no weight; his appetite is good. There is no history of vomiting. The bowels move daily.

Skiagram at our office reveals a stone in the bladder.

COMMENTS

DR. MURPHY (April 10, 1915): It is hard to believe that, with such a cleancut history which is typical for stone in the bladder, this patient was neglected for nearly two years and treated merely for "enuresis." Because of the chronicity of the lesion and the constant irritation by the stone the bladder has become congested and infected, as shown by the presence of pus in the urine and sometimes blood, and it may continue in a state of irritability for several years after operation. By employing modern methods of examination there is but little excuse for overlooking a vesical calculus,—even in children,—for, if a stone cannot be felt by the sound and by bimanual palpation, it will certainly be revealed by a skiagram: in the young child the bladder is practically an abdominal organ, thus facilitating detection

of a stone by the former method, while a stone in the young bladder is clearly revealed in the skiagram.

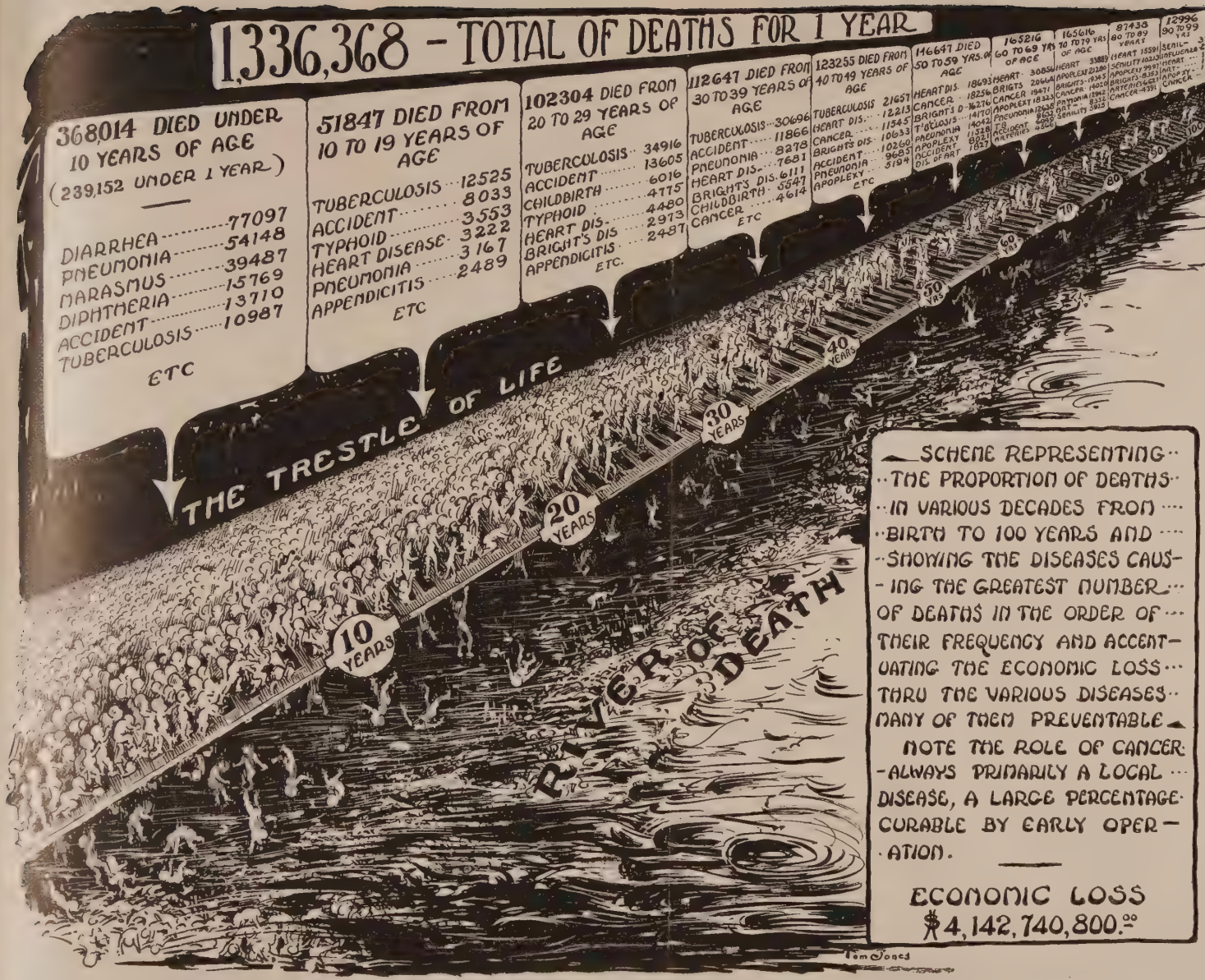
Shall we remove the stone by litholapaxy or lithotomy? A certain degree of risk attends the prolonged manipulations which are necessary in the crushing operation: we therefore prefer lithotomy, and advocate the suprapubic route. Until recent years lateral perineal lithotomy was the method of choice, but now we believe that approach to the bladder by this route entails an undue amount of unnecessary trauma, both to the perineal structures and to the important vesical sphincter. The suprapubic method, on the other hand, does not injure the bladder at a vulnerable point.

OPERATION

[By the same technic employed in the preceding case a single, smooth, non-faceted calculus was exposed, loosened from the mucosa in which it was imbedded, and removed. The bladder was carefully inspected to see that no additional calculi remained, and then closed as in the preceding case.]

Postscript.—There was rapid closure of the fistula, and the case progressed to recovery uneventfully.

[*N. B.* In conjunction with the abdominal cases published in this number the reader is referred to the report of 71 selected interesting cases,—mostly abdominal,—together with copious statistics, from the clinic of Dr. John B. Deaver at the German Hospital, Philadelphia (*International Clinics*, vol. iii, 23d series, 158–248).]


1,336,368 - TOTAL OF DEATHS FOR 1 YEAR
368,014 DIED UNDER 10 YEARS OF AGE
(239,152 UNDER 1 YEAR)
DIARRHEA 77097
PNEUMONIA 54148
MARASMUS 39487
DIPHTHERIA 15769
ACCIDENT 13710
TUBERCULOSIS 10987
ETC
51847 DIED FROM 10 TO 19 YEARS OF AGE
TUBERCULOSIS 12525
ACCIDENT 8033
TYPHOID 3553
HEART DISEASE 3222
PNEUMONIA 3167
APPENDICITIS 2489
ETC
102304 DIED FROM 20 TO 29 YEARS OF AGE
TUBERCULOSIS 34916
ACCIDENT 13605
CHILDBIRTH 6016
TYPHOID 4775
HEART DIS. 4480
BRIGHT'S DIS 2973
APPENDICITIS 2487
ETC.
112647 DIED FROM 30 TO 39 YEARS OF AGE
TUBERCULOSIS 30696
ACCIDENT 11866
PNEUMONIA 8278
HEART DIS. 7681
BRIGHTS DIS. 6111
CHILDBIRTH 5547
CANCER 4614
ETC
123255 DIED FROM 40 TO 49 YEARS OF AGE
TUBERCULOSIS 21657
HEART DIS. 12213
CANCER 11545
BRIGHT'S DIS 10633
ACCIDENT 10260
PNEUMONIA 9685
APOPLEXY 5194
ETC
146647 DIED 50 TO 59 YRS. OF AGE
HEART DIS. 18693
CANCER 18254
BRIGHT'S D 16276
PNEUMONIA 14170
APOPLEXY 14042
ACCIDENT 11328
DIS OF ART 8621
165216 60 TO 69 YRS OF AGE
HEART 30854
CANCER 19471
APOPLEXY 18343
PNEUMONIA 12638
ACCIDENT 8630
165616 70 TO 79 YRS OF AGE
HEART 33893
APOPLEXY 21280
BRIGHTS 11945
CANCER 10420
PNEUMONIA 7842
87438 80 TO 89 YEARS
HEART 15591
SENILITY 10233
APOPLEXY 9931
BRIGHTS 8323
CANCER 4331
12996 90 TO 99 YRS
SENILITY 3300
PNEUMONIA 2109
HEART 1113
ART. 1136
APOPLEXY 523
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10 YEARS
20 YEARS
30 YEARS
40 YEARS
50 YRS
60 YRS
70
80
90
100
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